IAP6 Rec'd PCT/PTO 26 MAR 2007

PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 05-597-B)

In re Application of:	)
June Man KIM and Noh Sang PARK	) Examiner: TBA
International Application No.: PCT/KR2004/01851	) Group Art Unit: TBA
U.S. Application No.: 10/560,664	) Confirmation No. 2304
International Filing Date: July 23, 2004	)
U.S. Filing Date: December 13, 2005	)
For: System And Method For Tracking Position of A Mobile Unit Using Beacons In A Mobile Communication System	)

Mail Stop PCT
Commissioner for Patents
Office of PCT Legal Administration
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL LETTER

Sir/Madam:

In regard to the above identified application.

1. We are transmitting herewith the attached:
   a) Renewed Petition Under 37 C.F.R. 1.47(b);
   b) Joo-Young Kim's Declaration In Support Of Petition Under 37 C.F.R. § 1.47(B) By Person Having Proprietary Interest To File Application On Behalf Of Inventor;
   c) Memorandum Of Law In Support Of Petition Under 37 C.F.R. § 1.47(B) By Person Having Proprietary Interest To File Application On Behalf Of Inventor with Exhibits 1-2;
   d) Schedule A;
   e) Jiwon Lim's DECLARATION IN SUPPORT OF RENEWED PETITION UNDER 37 CFR §1/47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTORS REFUSING TO SIGN, including Exhibits;
   f) Joo-Younng Kim's DECLARATION IN SUPPORT OF RENEWED PETITION UNDER 37 CFR §1/47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTORS REFUSING TO SIGN, including Exhibits; and
   g) Return Receipt Postcard.

2. With respect to fees:
   a) No fees are due at this time.
   b) Please charge any underpayment or credit any overpayment to our Deposit Account No. 13-2490.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, 32nd Floor
Chicago, IL 60606
Telephone: (312) 913-0001
Fax: (312) 913-0002

3. CERTIFICATE OF MAILING UNDER 37 CFR § 1.10: The undersigned hereby certifies that this Transmittal Letter and the papers, as described in paragraph 1 hereinabove, are being deposited with the United States Postal Service with sufficient postage as "Express Mail Post Office to Addressee," addressed to: Mail Stop PCT, Commissioner for Patents, Office of PCT Legal Administration, P.O. Box 1450, Alexandria, VA 22313-1450 on March 26, 2007 under Express Mail Certificate No. EV839329664US.

Respectfully submitted,

Date: March 26, 2007

Robert J. Irvine III
Registration No. 41,865

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, 32nd Floor
Chicago, IL 60606
Telephone: (312) 913-0001
Fax: (312) 913-0002

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P.O. Box 1450
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RENEWED PETITION UNDER 37 C.F.R. 1.47(b)

Dear Sir:

Reconsideration of the November 21, 2006 Decision on Petition Under 37 C.F.R. §1.47(b) by a Person Having Proprietary Interest to File an Application on Behalf of Non-Signing Inventors, filed October 13, 2006, is respectfully requested.

The petition was dismissed without prejudice for two reasons: 1) because Applicant's proof under 37 C.F.R. §147(b) that it has sufficient proprietary interest in the application was allegedly inadequate; and 2) because Applicant's proof that the inventor refused to cooperate after receiving a full set of application papers was insufficient.

After re-contacting the inventor, the Applicant has still bee unable to obtain the inventors' cooperation. The Applicant encloses the following documents to address the deficiencies alleged in the Dismissal:

1) Joo-Younng Kim's DECLARATION IN SUPPORT OF PETITION UNDER 37 C.F.R. § 1.47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTOR

2) MEMORANDUM OF LAW IN SUPPORT OF PETITION UNDER 37 C.F.R. § 1.47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTOR

3) SCHEDULE A

4) Jiwon Lim's DECLARATION IN SUPPORT OF RENEWED PETITION UNDER 37 CFR §1/47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTORS REFUSING TO SIGN, including Exhibits.

5) Joo-Younng Kim's DECLARATION IN SUPPORT OF RENEWED PETITION UNDER 37 CFR §1/47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTORS REFUSING TO SIGN, including Exhibits.

The Applicant believes that these documents sufficiently answer the alleged deficiencies of the previous Petition. Specifically, the inventors have now been presented with a full set of application materials, including specification, claims, and drawings, and both inventors continue to refuse to cooperate with the prosecution of this case. Furthermore, the Applicants believe that the enclosed documents prove the ownership of title of the present application, based on standard practice in Korea.

The Applicant requests that the Dismissal be deemed moot, and that the joinder of the inventors be acknowledged. Furthermore, the Applicant requests that the application be passed to substantive examination. If it would be deemed helpful, the PCT Attorney Advisor is encouraged to contact the undersigning attorney.

Respectfully submitted,

Date: March 26, 2007

Robert J. Irvine, III
Reg. No. 41,865
McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive, Ste. 3100
Chicago, Il 60606
Tel: 312 913 – 0001
Fax: 312 913 – 0002

DECLARATION IN SUPPORT OF PETITION UNDER 37 C.F.R. § 1.47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTOR

Dear Sir:

This Declaration is in support of Petition under 37 C.F.R. § 1.47(b) to allow UTStarcom, Inc. to make the application on behalf of the non-signing inventor(s) listed in **Schedule A**, column 3, whom we have been unable to locate.

1. I, **Joo-Young Kim**, am a citizen of Korea, residing at Sangyong, Apt No. 103-1101, Sungsu-dong 1-ga 16/3, Sungdong-gu, Seoul, Republic of Korea.

2. I am a Korean patent attorney with the law firm of Kim & Chang, located at Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea.

3. On behalf of Kim & Chang, I am representing UTStarcom Korea Limited, a wholly owned subsidiary of UTStarcom, Inc.

4. I am knowledgeable regarding Korean Patent Law.

5. I submit this declaration in support of the accompanying memorandum of law.

6. The Korean company Hyundai Syscomm filed the Korean National Application listed in **Schedule A, Column 6** as the applicant of record, with inventor(s) in **Schedule A, column 3** listed as the inventor(s).

7. The filing of the above-referenced Korean Application by Hyundai Syscomm was not opposed by the Examiner or any third party including the employee/inventor.

8. On April 27, 2004, UTStarcom, Inc., through its wholly owned subsidiary UTStarcom Korea Limited, acquired Hyundai Syscomm's Intellectual Property Portfolio, including the rights to the Korean National Application listed in **Schedule A, column 6**, and duly recorded this change of ownership with the Korean Intellectual Property Office without objection.

9. As a result of the acquisition, UTStarcom, Inc. became the sole proprietary owner of Hyundai Syscomm's Intellectual Property Portfolio, which includes the above-referenced Korean National Application.

10. UTStarcom Korea Limited filed the PCT application listed in **Schedule A, column 8**, claiming priority to the above-referenced Korean National Application.

11. The above-referenced PCT application entered U.S. National phase in the United States on the date listed in **Schedule A, column 5**, having the U.S. Application Serial Number listed in **Schedule A, column 4.**

12. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the

United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Date: 16-January-2007 By: Joo-Young Kim

Joo-Young Kim
Kim & Chang
Hungkuk Life Insurance Building, 9F,
226 Sinmunno 1-ga, Jongno-gu,
Seoul 110-786, Korea

MEMORANDUM OF LAW IN SUPPORT OF PETITION UNDER 37 C.F.R. § 1.47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTOR

This memorandum of law is in support of Petition under 37 C.F.R. § 1.47(b) to allow UTStarcom, Inc. ("UTStarcom") to make the application on behalf of a non-signing inventor.

BACKGROUND

UTStarcom submitted a Petition under 37 C.F.R. § 1.47(b) to allow UTStarcom to make the Application, listed in Schedule A, column 4, on behalf of the inventor listed in Schedule A, column 3, whom UTStarcom has been unable to locate. The Petition was denied on the grounds that UTStarcom allegedly failed to establish a proprietary interest in the above-referenced U.S. Application.

STATEMENT OF FACTS

All facts in support of the argument and conclusion are set forth in the Declaration of Andrew Choung under M.P.E.P. 409.03(f).

ARGUMENT AND CONCLUSION

UTStarcom should be awarded title to the above-referenced U.S. Application because UTStarcom, as the assignee of patent rights to the underlying Korean Application and subsequent patent applications granted by the assignor Hyundai Syscomm Inc. ("Hyundai Syscomm"), is the sole proprietary owner of the U.S. Application.

Under Korean Patent Law, UTStarcom is recognized as the owner of the Korean Application. First, the Korean Intellectual Property Office recognizes UTStarcom as the current owner of the Korean Application as a matter of record. Second, the invention disclosure form executed by the inventor in favor of Hyundai Syscomm, which includes an assignment of the subject matter of the Korean Application from the inventor to Hyundai Syscomm, is more than sufficient to overcome any challenge to UTStarcom's ownership interest.

The Korean Patent Act provides that a patent application of an employee may be filed directly by the employee's company, without an explicit assignment from the employee to the employee's company. *Korean Patent Act, Article 42* (See Attached Exhibit 1). Unless the examiner or a third party contests the company's right to file the application, the company becomes the owner of the application. Thus, even in the absence of an employee-inventor assignment, a Korean Patent Application filed by a company without contest by others is the proprietary owner of the patent rights. *See Korean Patent Act, Article 42, Para 1* (See Attached Exhibit 1).

In the instant case, Hyundai Syscomm filed the Korean National Application listed in **Schedule A, column 6**, as the named applicant. The filing of the application was not contested by the Examiner or any third party. Thus, under Korean Law, Hyundai Syscomm became the owner of the Korean application even in the absence of an employee inventor assignment. Subsequently, the Hyundai Syscomm's patent portfolio, including the above-mentioned Korean Application, was assigned to UTStarcom. This assignment was recorded with the Korean Intellectual Property Office, without objection, making UTStarcom the legal owner of the above-mentioned Korean Application.

Under the present circumstances, only the inventor(s) may challenge the legitimacy of Hyundai Syscomm's ownership of the Korean Application. *Korean Patent Act, Articles 34 and 35* (See Attached Exhibit 1). However, any challenge by the inventor(s) would fail under Korean Patent Law. The inventor(s) executed an invention disclosure form, which assigns the subject matter of the Korean Application to Hyundai Syscomm. Because the subject matter described in the invention disclosure form is virtually identical to the subject matter contained in the Korean Application, the assignment therein would be deemed by a Korean court of law to assign the Korean Application to Hyundai Syscomm. *See In-Chul Choi v. Samsung Electonics Co., Ltd., 2001 Gahap 13977 (Seoul District Court, August 22, 2002)* (See Attached Exhibit 2) (recognizing the validity of the assignment based on the content in the invention disclosure form despite the absence of a specific application number reference). Thus, even if challenged, the chain of title of the Korean Application would be sustained under Korean Patent Law and UTStarcom would remain the ultimate owner.

This ownership of the Korean Application, in conjunction with the other assignment terms of the acquisition agreement previously submitted, establishes UTStarcom's rights to the subsequent PCT application and U.S. national phase application. Thus, UTStarcom has a proprietary interest in the referenced U.S. Application listed in Schedule A, column 3, and should be allowed to make the application in U.S. on behalf of the missing inventor under 37 C.F.R. § 1.47(b).

Respectfully submitted

Date: 16-January-2007 By: Joo-Young Kim

Joo-Young Kim

Kim & Chang
Hungkuk Life Insurance Building, 9F,
226 Sinmunno 1-ga, Jongno-gu,
Seoul 110-786, Korea

Exhibit 1

[KOREAN PATENT ACT]	[TRANSLATION]
제 34 조 (무권리자의 특허출원과 정당한 권리자의 보호) 발명자가 아닌 자로서 특허를 받을 수 있는 권리의 승계인이 아닌 자(이하 "무권리자"라 한다)가 한 특허출원이 제 33 조제 1 항 본문의 규정에 의한 특허를 받을 수 있는 권리를 가지지 아니한 사유로 제 62 조 제 2 호에 해당되어 특허를 받지 못하게 된 경우에는 그 무권리자의 특허출원후에 한 정당한 권리자의 특허출원은 무권리자가 특허출원한 때에 특허출원한 것으로 본다. 다만, 무권리자가 특허를 받지 못하게 된 날부터 30 일을 경과한 후에 출원을 한 경우에는 그러하지 아니하다.	**Article 34 (Patent Application Filed by an Unentitled Person and Protection of the Lawful Holder of a Right)** Where a patent cannot be granted because an application was filed by a person who is not the inventor or a successor to the right to obtain a patent (referred to as "an unentitled person") under Article 33(1) as prescribed in Article 62(ii), a subsequent application filed by the lawful holder of the right is deemed to have been filed on the filing date of the earlier application filed by the unentitled person. This provision does not apply, however, if the subsequent application is filed by the lawful holder of the right more than thirty days after the date on which the application filed by the unentitled person was rejected.
제 35 조 (무권리자의 특허와 정당한 권리자의 보호) 제 33 조제 1 항 본문의 규정에 의한 특허를 받을 수 있는 권리를 가지지 아니한 사유로 제 69 조 제 1 항 제 2 호에 해당되어 특허취소결정이 확정된 경우 또는 제 33 조 제 1 항 본문의 규정에 의한 특허를 받을 수 있는 권리를 가지지 아니한 사유로 제 133 조 제 1 항 제 2 호에 해당되어 특허를 무효로 한다는 심결이 확정된 경우에는 그 특허출원후에 한 정당한 권리자의 특허출원은 취소 또는 무효로 된 그 특허의 출원시에 특허출원한 것으로 본다. 다만, 그 특허의 등록공고가 있는 날부터 2 년을 경과한 후에 특허출원을 하거나 취소결정 또는 심결이 확정된 날부터 30 일을 경과한 후에 특허출원을 한 경우에는 그러하지 아니하다.	**Article 35 (Patent Granted to an Unentitled Person and Protection of the Lawful Holder of a Right)** Where a decision to revoke a patent becomes final for lack of entitlement to obtain a patent under Article 33(1) as prescribed in Article 69(1)(ii) or a decision to invalidate becomes final due to a lack of entitlement under Article 33(1) as prescribed in Article 133(1)(ii), a subsequent application filed by the lawful holder of the right is deemed to have been filed on the filing date of the revoked or invalidated application. However, this provision does not apply if the subsequent application is filed more than two years after the publication date of the first application or more than thirty days after the decision to revoke or invalidate becomes final.

[KOREAN PATENT ACT]

제 42 조 (특허출원)
①특허를 받고자 하는 자는 다음 각호의 사항을 기재한 특허출원서를 특허청장에게 제출하여야 한다.

1. 특허출원인의 성명 및 주소(법인인 경우에는 그 명칭 및 영업소의 소재지)
2. 특허출원인의 대리인이 있는 경우에는 그 대리인의 성명 및 주소나 영업소의 소재지(대리인이 특허법인인 경우에는 그 명칭, 사무소의 소재지 및 지정된 변리사의 성명)
3. 삭제
4. 발명의 명칭
5. 발명자의 성명 및 주소
6. 삭제

[TRANSLATION]

Article 42 (Patent Application)
(1) A person seeking to register a patent shall file a patent application with the Commissioner of the Korean Intellectual Property Office, stating the following:
(i) the name and address of the applicant (and, if a legal entity, the name and address of the business);
(ii) the name and residential or business address of the agent, if any (and, if the agent is a patent legal entity, the name and address of the business and the name of the designated patent attorney);
(iii) deleted;
(iv) the title of the invention;
(v) the name and address of the inventor;
(vi) deleted.

Exhibit 2

[Translation]

Seoul Southern District Court

Judgment

Case No.	2001 Gahap 13977
Plaintiff:	In Chul Choi
Defendant:	Samsung Electronics Ltd.
Pronouncement:	August 22, 2002

ORDER

The confirmation claim of the present action is dismissed.

Tenor of Complaint

Plaintiff hereby seeks confirmation that the patented inventions, described in the patent right list of the accompanying sheet, do not belong to an in-service invention.

GROUNDS

1. Findings of Facts

A. The Defendant's company, taking fabrication, sale, etc. of communication mechanisms and related devices as its objective under its constitution, has manufactured mobile-phone terminals since May of 1989. The Plaintiff entered the Defendant's company on January 10, 1989, and had served as a member of a team known as the "Time Machine Team (TMT)" between July 13, 1992 and February 16, 1995.

B. TMT of the Defendant's company is a department that was organized by selecting incumbent staff to create ideas for new product development. TMT holds a weekly evaluation meeting, where team members exchange ideas equipped with marketability and practicability, and hold quarterly meetings that report the results to the board of directors, assigning no specific tasks to its team members. The Plaintiff was mainly focused on conceiving and commercializing a new Hangul inputting method, submitting a report titled "Value of Text in the Multimedia World" showing the needs and practicability

of a new Hangul inputting method on May 20, 1994, and a report titled "First report regarding commercialization drive of a new Hangul inputting method" on July 18, 1994, together with his teammate, Dong Ki Rui.

C. During his tenure on TMT, the Plaintiff invented "Method and Apparatus for Generating Text Inputting Codes (hereinafter, referred to as the 'first invention')," described in patent right list 1 of the accompanying sheet, and transferred the right to obtain a patent for the Defendant's company while providing an in-service invention report on the first invention on February 19, 1993. The Defendant's company filed a patent application for the first invention in its name on July 6, 1993, and completed the patent registration on March 13, 1996.

D. Furthermore, the Plaintiff, together with his teammate, Dong Ki Rui, invented "Method and Apparatus for Generating Text Inputting Codes (hereinafter, referred to as the 'second invention')" described in patent right list 2, and transferred the right to obtain a patent for the Defendant's company while providing an in-service invention report on the second invention on October 13, 1994. The Defendant's company filed a patent application for the second invention in its name on May 11, 1995, and completed the patent registration on August 10, 1998.

E. The Defendant's company has manufactured and sold mobile-phone terminals using the text inputting methods of the inventions since November of 1998.

2. The Plaintiff's Claims and Holding thereon

A. Gist of the Plaintiff's Claims

The Plaintiff seeks: (a) confirmation that the fist and second inventions are not an in-service invention, arguing that the inventions were misconceived as an in-service invention and filed in the name of the Defendant's company although they actually belong to a liberal invention; and (b) the Defendant's return of 1 billion KrW as part of an unjust enrichment, arguing that since the contracts of transfer were based on a misconception for

the inventions to be an in-service invention are invalid, the Defendant is not a legitimate patentee and has an obligation to return, to the Plaintiff, the profits earned by practicing the inventions as an unjust enrichment.

B. Relevancy of the Confirmation Claim

The Defendant made a defense prior to a main hearing that the Plaintiff's confirmation claim lacks eligibility and thus is irrelevant because it seeks confirmation of a factual matter. The Plaintiff seeks the confirmation for the first and second inventions to not be an in-service invention as a basis for the unjust enrichment return claim being sought by the present action. This is to confirm part of a legal requirement fact, and thus is irrelevant. Furthermore, the confirmation stake of a confirmation action can be recognized if the obtainment of a confirmation judgment is the most effective and appropriate means for eliminating the challenge and risk when the plaintiff's legal status is challenged and risked. However, as will be seen in item C. (1), even though the first and second inventions were not an in-service invention, this would not affect the patent right registered in the name of the Defendant's company, unless the invalidation decision is rendered and becomes final and conclusive in a patent registration invalidation trial. Therefore, because seeking the confirmation for the inventions to not be an in-service invention cannot be seen as an effective and appropriate means, the Plaintiff's confirmation claim of the present action is irrelevant.

C. Unjust Enrichment Return Claim

(1) The Plaintiff argues first, that since the first and second inventions are not an in-service invention but a liberal one, each contract for transferring each right to obtain a patent to the Defendant is invalid per se for primitive impossibility of the objective of a legal activity or under Article 39, Paragraph 1 of the Patent Act, or invalid for violating Article 103 of the Civil Code.

In regard to this, if the first and second inventions belong to a liberal invention, Article 39, Paragraph 1 of the Patent Act stipulates that an invention constitutes an in-service invention if the invention was made by an employee, etc. in connection with his/her service and falls by nature within the business

range of the employer, etc., and the activity resulting into the invention was part of the present or past duties of the employee, etc.

As previously seen, the Defendant's company takes the fabrication and sale of communication mechanisms as one of its founding objectives, and has set the mobile-phone terminal as one of the primary manufactured items from the year of 1989 through to the present time. Since the inventions are directed to a text inputting method usable for mobile-phone terminals, these are regarded to fall within the business range of the Defendant's company. Furthermore, the Plaintiff's then duty was to create ideas for new products development in the field of the information and telecommunication at the time of conceiving each invention, and the Plaintiff reached the first and second inventions substantially as a result of focusing mainly on collecting ideas for a Hangul inputting method. As such, each invention is determined to fall within the Plaintiff's duty.

Therefore, since the first and second inventions should belong to an in-service invention, the Plaintiff's arguments contend the validity of each transfer contact on premise of the opposite.

(2) The Plaintiff also argues that since the patent application for the second invention was filed four months after the Defendant's company succeeded to the right to the invention from the Plaintiff, the second invention should be regarded as a liberal invention under Article 11, Paragraph 1 of the Invention Promotion Act, and the Defendant should return unjust enrichment, amounting to the royalty of a non-exclusive license, for failing to obtain consent to a non-exclusive license from the inventor Plaintiff under Article 2 of the same.

Article 11 of the Invention Promotion Act views an invention as a liberal invention in case an employer, etc. fails to file a patent application within a period designated under the Presidential Order (Article 5 of the same designates the period for four months) after succeeding the right to an in-service invention or waive filing of the application in writing (Paragraph 1), and stipulates that the employer, etc. cannot own a non-exclusive license to the in-service invention being regarded as a liberal one without the consent of the employee, etc in spite of Article 39, Paragraph 1 of the Patent Act (Paragraph

2). The fact that the Defendant's company filed the application for the second invention on May 11, 1995, four months passing from October 13, 1994 when the Defendant's company succeeded to the right to the second invention from the Plaintiff, is as previously seen.

However, even if the Defendant's company had completed the patent registration in its name, although the transfer contract of the second invention was invalidated under the above provision and the Defendant's company did not have a right to obtain a patent, the Plaintiff could not assert invalidity of the patent right having been registered in the name of the Defendant's company until the patent invalidation decision goes final and conclusive. Of course, the Plaintiff could request a patent invalidation trial based on the above grounds, which however, is not feasible here. Therefore, the Defendant has a right to legally practice the invention, and needs not obtain consent of the Plaintiff for practicing the invention because the Plaintiff did not register the patent in his/her own name. As such, the Plaintiff's above arguments are groundless and unreasonable.

서 울 지 방 법 원

남 부 지 원

판 결

사 건	**2001가합13977호**
원 고	최인철
피 고	삼성전자주식회사
판 결 선 고	2002. 8. 22.

주 문

이 사건 소 중 확인청구 부분을 각하한다.

청 구 취 지

원고와 피고 사이에서 별지 특허권목록 기재 1, 2의 특허발명은 직무발명이 아님을 확인한다.

이 유

1. 기초사실

가. 피고회사는 통신기계기구 및 관련기구와 그 부품의 제작, 판매 등을 그 정관상의 목적으로 하고, 1989. 5.경부터 이동전화단말기를 생산해 온 회사이고, 원고는 1989. 1. 10. 피고회사에 입사하여 1992. 7. 13.부터 1995. 2. 16.까지 사이에 피고회사의 '타임머쉰팀'에 소속되어 근무하였다.

나. 피고회사의 '타임머쉰팀'은 신상품개발을 위한 아이디어 창출을 위하여 사내공모를 통해 직원을 선발, 조직한 부서로 그 팀원들은 구체적인 특정 업무를 맡지 아니한 채 매주 팀원들간에 시장성과 실현성 있는 아이디어를 제출하는 평가회를 가지고, 분기별로 경영진을 대상으로 그 결과물을 발표하는 정기 보고회를 개최하였는데, 원고는 같은 팀원인 류동기와 함께 1994. 5. 20. 새로운 한글입력방식의 필요성과 실용화 방안에 관한 '멀티미디어 세계에서 문자의 가치'라는 보고서를, 1994. 7. 18. '새로운 한글입력방법 사업화추진 1차 보고서'를 각 제출하는 등 주로 새로운 한글입력방식의 고안 및 사업화에 주력하였다.

다. 원고는 위 타임머쉰팀에 근무하던 중, 별지 특허권목록 1. 기재의 '문자입력코드 발생방법 및 장치'(이하 '제1발명'이라 한다)를 발명하고, 1993. 2. 19. 피고회사에 제1발명에 관한 직무발명신고를 하면서 특허받을 권리를 양도하였으며, 피고회사는 1993. 7. 6. 피고회사 명의로 제1발명에 관한 특허를 출원하여 1996. 3. 13. 특허등록을 마쳤다.

라. 또한 원고는 위 류동기와 함께 위 목록 2. 기재의 '문자입력코드 발생장치 및 방법'(이하 '제2발명'이라 한다)을 발명하고, 1994. 10. 13. 피고회사에 제2발명에 관한 직무발명신고를 하면서 특허받을 권리를 양도하였으며, 피고회사는 1995. 5. 11. 피고회사 명의로 제2발명에 관한 특허를 출원하여 1998. 8. 10. 특허등록을 마쳤다.

마. 피고회사는 1998. 11.경부터 위 발명들의 문자입력방식을 이용한 이동전화단말기를 생산, 판매해 오고 있다.

2. 원고의 청구 및 이에 대한 판단

가. 원고의 청구내용

원고는 ① 위 각 발명은 원고 개인의 자유발명에 해당됨에도 직무발명으로 오인되어 피고 명의로 특허등록이 된 것이라고 주장하면서 제1, 2발명이 직무발명이 아니라는 확인을 구하고, ② 위 발명들을 직무발명으로 오인하고 체결한 각 양도계약이 무효인 이상 정당한 특허권자가 아닌 피고는 위 발명들을 실시하여 얻은 수익을 부당이득으로서 원고에게 반환할 의무가 있다고 주장하면서, 그 일부로서 10억원을 지급할 것을 구한다.

나. 확인청구 부분의 적법성

피고는, 원고의 위 확인청구는 사실관계의 확인을 구하는 것으로 확인의 소의 대상적격이 없어 부적법하다고 본 안전 항변을 하므로 살피건대, 원고의 위 확인청구는 원고가 이 사건 소로써 구하고 있는 부당이득반환청구의 전제로 제1, 2발명이 직무발명이 아니라는 확인을 구하는 취지인바, 이는 법률요건사실 일부의 확인을 구하는 것이어서 부적법하고, 또한 확인의 소에 있어서 확인의 이익은 원고의 법적 지위가 불안, 위험할 때 그 불안, 위험을 제거하는데 있어 확인판결을 받는 것이 가장 유효·적절한 수단인 경우에 인정된다 할 것인데, 아래 다.의 (2)항에서 보는 바와 같이 가사 제1, 2발명이 직무발명이 아니라 하더라도 특허무효심판절차에서 무효심결이 확정되지 아니하는 이상에는 피고회사 명의로 등록된 특허권에 어떠한 효력이 미친다고 볼 수도 없으므로, 위 발명들이 직무발명이 아니라는 확인을 구하는 것은 원고에게 현존하는 법적 불안, 위험을 해소할 수 있는 유효·적절한 수단이라 할 수 없으니, 결국 원고의 이 사건 소 중 확인청구 부분은 부적법하다.

다. 부당이득반환청구 부분

(1) 원고는 먼저, 제1, 2발명은 직무발명이 아닌 자유발명이므로 그 특허받을 권리를 피고에게 양도한 위 각 양도계약은 법률행위 목적의 원시적 불능 또는 특허법 제39조 제3항에 의하여 당연 무효이거나 민법 제103조에 위반되어 무효라고 주장한다.

그러므로 과연 제1, 2발명이 자유발명인지에 관하여 보건대, 특허법 제39조 제1항은 직무발명의 개념에 관하여 종업원 등이 그 직무에 관하여 발명한 것이 성질상 사용자 등의 업무범위에 속하고, 그 발명을 하게 된 행위가 종업원 등의 현재 또는 과거의 직무에 속하는 경우 그 발명은 직무발명이라고 규정하고 있다.

앞에서 본 바와 같이 피고회사는 통신기계기구의 제작, 판매를 그 설립목적의 하나로 규정하고 있고, 1989년부터 현재까지 이동전화단말기를 주요 생산품목으로 하고 있으며, 위 발명들은 이동전화단말기에 이용될 수 있는 문자입력방식에 관한 발명이므로 피고회사의 업무범위에 속한다 할 것이다. 또한 위 각 발명 당시 원고의 직무는 정보통신부분의 신상품 개발을 위한 아이디어를 창출하는 것으로 실제 한글입력방식에 관한 아이디어 계발에 주력한 결과 제1, 2발명에 이르게 되었으므로 위 각 발명 행위는 원고의 직무에 속한다 할 것이다.

따라서 제1, 2발명은 직무발명에 해당한다고 보아야 할 것이므로, 위 발명들이 직무발명이 아님을 전제로 각 양도계약의 효력을 다투는 원고의 주장은 더 나아가 살필 것 없이 이유 없다.

(2) 원고는 또한, 제2발명에서는 피고회사가 원고로부터 발명에 관한 권리를 승계한 때로부터 4개월이 지나서 특허를 출원하였으므로 이는 발명진흥법 제11조 제1항에 의하여 자유발명으로 간주되고, 같은 조 제2항에 따라 발명자인 원고로부터 통상실시에 대한 동의를 받지 아니한 이상 피고는 원고에게 통상실시료 상당의 부당이득을 반환하여야 한다고 주장한다.

살피건대, 발명진흥법 제11조는 사용자 등이 직무발명에 관한 권리를 승계한 후 대통령령이 정하는 기간(같은 법 시행령 제5조는 그 기간을 4개월로 정하고 있다) 내에 출원을 하지 아니하는 경우 또는 서면으로 그 출원을 포기한 경우 당해 발명은 자유발명으로 보고(제1항), 자유발명으로 보는 직무발명에 대하여는 특허법 제39조 제1항의 규정에도 불구하고 당해 발명을 한 종업원 등의 동의를 받지 아니하고는 통상실

시권을 가질 수 없다(제2항)고 규정하고 있고, 피고회사가 원고로부터 제2발명에 관한 권리를 승계한 1994. 10. 13.로부터 4개월이 경과한 1995. 5. 11.에야 위 발명에 관한 특허를 출원한 사실은 앞에서 본 바와 같다.

그러나 가사 위 법률규정에 의하여 제2발명에 관한 양도계약이 무효가 되어 피고회사가 특허를 받을 권리를 가지지 아니함에도 불구하고 그 명의로 특허등록을 마쳤다 하더라도 원고가 그와 같은 사유를 들어 특허무효심판을 청구함은 별론으로 하고 특허무효심결이 확정되기 전에는 피고 명의로 등록된 특허권의 무효를 주장할 수는 없는 것이므로 피고는 특허권자로서 적법하게 그 발명을 실시할 권리가 있고, 또한 원고가 자기 명의로 특허등록을 받지 아니한 이상 피고회사가 위 발명을 실시함에 있어 원고의 동의를 얻어야 한다고 볼 수도 없으므로, 원고의 위 주장은 이유 없다.

SCHEDULE A

	1	2	3	4	5	6	7	8	9
	MBHB Reference No.	**Title**	**Inventor(s)**	**U.S. Application No.**	**U.S. Filing Date**	**Korean Application No.**	**Filing Date (Korean Application)**	**PCT Application No.**	**Filing Date PCT National Phase**
1	05-386-B	Method For Stabilizing BTS Using E1 Trunk Board Duplexing Of BSC	Se Yeon KIM	10/545,922	August 17, 2005	2003-0018549	March 25, 2003	PCT/KR2004/00645	March 24, 2004
2	05-390-B	Method For Optimizing A DSP Input Clock Using A Comparing/Analyzing Circuit	Seong Chul SHIN	10/545,505	August 12, 2005	2003-0018553	March 25, 2003	PCT/KR2004/00655	March 24, 2004
3	05-392-B	Method For Trunk Line Duplexing Protection Using A Hardware Watchdog	Yeong Weon JUNG	10/545,895	August 17, 2005	2003-0018554	March 25, 2003	PCT/KR2004/00654	March 24, 2004
4	05-428-B	Device for Implementing a RNC Using LVDS	Kyung Hwan AN	10/559,738	December 6, 2005	2003-0051165	July 24, 2003	PCT/KR2004/01858	July 23, 2004
5	05-428-C	Device for Implementing a RNC Using LVDS	Kyung Hwan AN	11/534,965	September 25, 2006	2003-0051165	July 24, 2003	PCT/KR2004/01858	July 23, 2004
6	05-429-B	Method of Allocating Links in a IX EVDO System	Kye Chol CHO	10/560,297	December 12, 2005	2003-0051466	July 25, 2003	PCT/KR2004/01880	July 26, 2004
7	05-432-B	Method for Downloading a Single Firmware Image File to Client Systems Having Different CPU Modules	Chan Soo PARK	10/559,225	December 6, 2005	2003-0051153	July 24, 2003	PCT/KR2004/01853	July 23, 2004
8	05-432-C	Method for Downloading a Single Firmware Image File to Client Systems Having Different CPU Modules	Chan Soo PARK	11/534,970	September 25, 2006	2003-0051153	July 24, 2003	PCT/KR2004/01853	July 23, 2004

SCHEDULE A

	MBHB Reference No.	Title	Inventor(s)	U.S. Application No.	U.S. Filing Date	Korean Application No.	Filing Date (Korean Application)	PCT Application No.	Filing Date PCT National Phase
9	05-433-B	Method for Unifying Operations of Boards by Using Logical Addresses Thereof	Yoon Mi HWANG	10/559,235	December 6, 2005	2003-0051155	July 24, 2003	PCT/KR2004/01855	July 23, 2004
10	05-433-C	Method for Unifying Operations of Boards by Using Logical Addresses Thereof	Yoon Mi HWANG	11/534,960	September 25, 2006	2003-0051155	July 24, 2003	PCT/KR2004/01855	July 23, 2004
11	05-434-B	Method for Establishing an ATM Traffic Channel Path Between a BSC and a BTS in an EV-DO System	Woo Seog KOO	10/560,142	December 9, 2005	2003-0051157	July 24, 2003	PCT/KR2004/001856	July 23, 2004
12	05-438-B	ATM Switch for use in W-CDMA	Cheol Hyun JANG	10/545,578	August 16, 2005	2003-0018557	March 25, 2003	PCT/KR2004/00658	March 25, 2004
13	05-439-B	Remote Unit for Adding Frequency Assignments to a Separation-Type Base Transceiver Station	Jae Ick LEE	10/556,267	November 14, 2005	2003-0034799	May 30, 2003	PCT/KR2004/01276	May 28, 2004
14	05-476-C	Apparatus and Method for Tracking the Position/Object Using a Mobile Communication Network	Choon Geun CHO	10/567,529	February 7, 2006	2003-0066875	September 26, 2003	PCT/KR2004/02466	September 24, 2004
15	05-496-C	Method of Controlling Power in a CDMA-2000 System	Tae Ik SONG	10/568,234	February 14, 2006	2003-0067736	September 30, 2003	PCT/KR2004/02469	September 24, 2004
16	05-497-C	Method of Controlling Power in a W-CDMA Mobile Communication System	Dong Keun KIM	10/569,046	February 22, 2006	2003-0067737	September 30, 2003	PCT/KR2004/02470	September 24, 2004

SCHEDULE A

	MBHB Reference No.	Title	Inventor(s)	U.S. Application No.	U.S. Filing Date	Korean Application No.	Filing Date (Korean Application)	PCT Application No.	Filing Date PCT National Phase
17	05-498-C	Method of Controlling Data Rate for a Forward Data Service in a CDMA 2000-1X System	Jung Han LEE	10/569,041	February 22, 2006	2003-0067738	September 30, 2003	PCT/KR2004/02471	September 24, 2004
18	05-500-B	ATM Switched Router for Transmitting IP Packet Data	Jung Hee PARK	10/585,586	July 11, 2006	2004-0002981	January 15, 2004	PCT/KR2005/00133	January 14, 2005
19	05-507-B	Apparatus and Method for Dualizing an Asynchronous Transfer Mode (ATM) Router in a CDMA2000 System	Tae Hong KIM	10/585,602	July 11, 2006	2004-0002973	January 15, 2004	PCT/KR2005/00134	January 14, 2005
20	05-509-B	Method for Correcting Time Data in a Network Management Application Using a SNMP	Sang Dae PARK	10/586,086	July 13, 2006	2004-0002979	January 15, 2004	PCT/KR2005/00138	January 14, 2005
21	05-511-B	Apparatus and Method for Sensing Faults of Application Programs in a CDMA System	Ki Sung LYU	10/586,289	July 13, 2006	2004-0002980	January 15, 2004	PCT/KR2005/00139	January 14, 2005
22	05-517-B	Automatic Update System and Method for Using a META MIB	Young Jin KIM	10/586,087	July 13, 2006	2004-0002982	January 15, 2004	PCT/KR2005/00140	January 14, 2005

SCHEDULE A

	MBHB Reference No.	Title	Inventor(s)	U.S. Application No.	U.S. Filing Date	Korean Application No.	Filing Date (Korean Application)	PCT Application No.	Filing Date PCT National Phase
23	05-518-B	Structure of a Management Information Base Communicated Between a Network Management System and an Agent of a Network Element	Kwang Seok KANG	10/585,838	July 12, 2006	2004-0002983	January 15, 2004	PCT/KR2005/00141	January 14, 2005
24	05-595-B	Method of Distributing Network Traffic in a Mobile Communication System	Hyun Young SHIN	10/556,924	November 14, 2005	2003-0035283	June 2, 2003	PCT/KR2004/01310	June 2, 2004
25	05-597-B	System and Method for Tracking Position of a Mobile Unit Using Beacons in a Mobile Communications System	June Man KIM	10/560,664	December 13, 2005	2003-0050916	July 24, 2003	PCT/KR2004/01851	July 23, 2004
26	05-615-B	Method for Call Completion Service	Sea Gon CHUN	10/556,274	November 14, 2005	2003-0034806	May 30, 2003	PCT/KR2004/01274	May 28, 2004
27	05-616-B	Method for Automatically Setting a Frequency of a Base Station in a CDMA-2000 System	Ju Hyun BAN; Sang Won SON	10/561,351	December 19, 2005	2003-0051154	July 24, 2003	PCT/KR2004/01854	July 23, 2004

PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 05-597-B)

In re Application of:	
June Man Kim, et al.	Examiner: TBA
International Application No.: PCT/KR2004/01851	Group Art Unit: TBA
U.S. Application No.: 10/560,664	Confirmation No. 2304
International Filing Date: July 23, 2004	
U.S. Filing Date: December 13, 2005	
For: System And Method For Tracking Position Of A Mobile Unit Using Beacons In A Mobile Communication System	

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION IN SUPPORT OF RENEWED PETITION UNDER 37 C.F.R. § 1.47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTORS REFUSING TO SIGN

Dear Sir/Madam:

This Declaration is submitted in support of Petition under 37 C.F.R. § 1.47(b) to allow UTStarcom, Inc. to file the application on behalf of inventors, June Man KIM and Noh Sang PARK, who have refused to sign.

1. I, **Jiwon LIM**, am a paralegal at the law firm of Kim & Chang.

2. I have first-hand knowledge of the facts recited herein.

3. This Declaration is in support of U.S. Patent Application entitled "SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING

BEACONS IN A MOBILE COMMUNICATION SYSTEM," which was filed with the U.S. Patent & Trademark Office on December 13, 2005 and bearing U.S. Application No. 10/560,664 and International Application No. PCT/KR2004/01851.

3. I am a paralegal at the law firm of Kim & Chang, which is located at Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea.

4. Kim & Chang represents UTStarcom Korea Limited, which is a subsidiary of UTStarcom, Inc.

5. I am a citizen of Korea residing at 840-7 Mia-dong, Gangbuk-gu, Seoul 142-820, Republic of Korea.

6. On March 8, 2005, I sent (via contents-certified mail) a letter including assignment documents to the last-known addresses of Mr. June Man KIM (Sinhan Apt 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea) and Mr. Noh Sang PARK (Jangmi Kolon Apt 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea). (See attached Exhibit 1).

7. A corresponding e-mail with the attached scanned copies of the mailed packets was sent to Mr. KIM (juneman@saekdong.net) and Mr. PARK (nspark@shinbiro.com). (See attached Exhibit 1).

8. On March 9, 2006, the contents-certified mail packet sent to Mr. PARK was returned due to an error in the address. (See attached Exhibit 2).

9. On March 19 2006, Mr. PARK replied via e-mail to notify me of his new address. He requested that I resend the assignment documents to his corrected address via e-mail. (See attached Exhibit 3).

10. On March 20, 2006, I responded to Mr. PARK via email, attaching a new set of signature documents. I further requested that he communicate with his co-inventor, Mr. KIM, and return the signed documents as soon as possible. I also asked

Mr. PARK to send Mr. KIM's contact information to me. I received no response. (See attached Exhibit 4).

11. On April 11, 2006, at 10:30 am, I telephoned Mr. PARK on his mobile phone (017-342-3248). I inquired as to whether Mr. PARK would cooperate with the current assignee by signing the assignment documents. Mr. PARK responded that he had spoken with Mr. KIM, and that they would both sign the assignment documents if they were paid.

12. On May 13, 2006, I sent an e-mail to both inventors, explaining UTStarcom's offer to pay each inventor USD $250 as a courtesy disbursement for their cooperation if the assignment documents were signed and returned. (See attached Exhibit 5).

13. On June 20, 2006, I called Mr. PARK at 2:41 PM. Mr. PARK finally confirmed that both inventors would not cooperate with the current assignee. Mr. PARK did not specify any reason for their refusal to cooperate. (See attached Exhibit 6).

14. On February 7, 2007, I sent all U.S. application papers, including the full specification, drawings and claims, to Mr. PARK and Mr. KIM via e-mail. (See attached Exhibit 7).

15. On March 7, 2007, I sent a content-certified letter to Mr. PARK and Mr. KIM confirming their refusal to cooperate. (See attached Exhibit 9). I received no response to this letter.

16. I hereby declare that all statements made herein are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made under penalty of perjury and that such willful false statements may jeopardize the validity of the specification or any patent issued thereon.

Respectfully submitted,

Date: March 23, 2007

By: Jiwon Lim

Jiwon LIM
Kim & Chang
Hungkuk Life Insurance Building, 9F,
226 Sinmunno 1-ga, Jongno-gu,
Seoul 110-786, Korea

PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 05-597-B)

In re Application of:	
June Man Kim, et al.	Examiner: TBA
International Application No.: PCT/KR2004/01851	Group Art Unit: TBA
U.S. Application No.: 10/560,664	
	Confirmation No. 2304
International Filing Date: July 23, 2004	
U.S. Filing Date: December 13, 2005	
For: System And Method For Tracking Position Of A Mobile Unit Using Beacons In A Mobile Communication System	

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION IN SUPPORT OF RENEWED PETITION UNDER 37 C.F.R. § 1.47(b) BY PERSON HAVING PROPRIETARY INTEREST TO FILE APPLICATION ON BEHALF OF INVENTORS REFUSING TO SIGN

Dear Sir/Madam:

This Declaration is submitted in support of Petition under 37 C.F.R. § 1.47(b) to allow UTStarcom, Inc. to file the application on behalf of inventors, June Man KIM and Noh Sang PARK, who have refused to sign.

1. I, **Jooyoung Kim**, am a patent attorney at the law firm of Kim & Chang.

2. I have first-hand knowledge of the facts recited herein.

3. This Declaration is in support of U.S. Patent Application entitled "SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM," which was filed with the U.S.

Patent & Trademark Office on December 13, 2005 and bearing U.S. Application No. 10/560,664 and International Application No. PCT/KR2004/01851.

3. I am a patent attorney at the law firm of Kim & Chang, which is located at Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea.

4. Kim & Chang represents UTStarcom Korea Limited, which is a subsidiary of UTStarcom, Inc.

5. I am a citizen of Korea residing at Ssang-Yong Apt. 103-1101, 706 16/3 Sungsu-dong 1-ga, Sungdong-gu, Seoul 133-923, Republic of Korea.

6. On February 9, 2007, I telephoned Mr. KIM at 2:57 PM, in which Mr. Kim once again refused to cooperate. Specifically, he did not wish to be involved in this matter or any of its subsequent issues. (See attached Exhibit 8).

7. On February 27, 2007, I telephoned Mr. PARK at 6:52 PM, in which Mr. Park once again refused to cooperate. Specifically, he did not wish to be involved in this matter or any of its subsequent issues. (See attached Exhibit 8).

8. I hereby declare that all statements made herein are of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made under penalty of perjury and that such willful false statements may jeopardize the validity of the specification or any patent issued thereon.

Respectfully submitted,

Date: March 23, 2007

By: Jooyoung Kim

Jooyoung Kim
Kim & Chang
Hungkuk Life Insurance Building, 9F,
226 Sinmunno 1-ga, Jongno-gu,
Seoul 110-786, Korea

EXHIBIT 1

[Translation]

KIM & CHANG

Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea
Telephone: (822) 764-8855 / 2122-3900 Fax: (822) 741-0328 / 745-5954 / 763-7434
E-Mail: all@ip.kimchang.com

March 8, 2006

To. June Man Kim (e-mail: juneman@saekdong.net)
Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

To. Noh Sang Park (e-mail: nspark@shinbiro.com)
Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Re. Declaration and Power of Attorney and Assignment to be filed with U.S. Patent and Trademark Office (U.S. Serial No. 10/560,664)
K&C Ref.: GP048360

I hope your business is prospering.

I am a patent attorney for a law firm, Kim & Chang, and contacting you on behalf of my client UTStarcom Korea Limited.

You had assigned your invention as identified on the next page to your former company in 2003, which was conceived when you were working for Hyundai Electronics Industries, Co., Ltd./ Hyundai Syscomm, Inc. under the provisions of the employee's invention compensation policy of the company. Therefore, the right to receive patent for the invention was transferred to the former company. Recently, the right to receive patent was transferred to our client, UTStarcom Korea Limited, hereinafter referred to as "UTSK" from your former company. With respect to this invention, a Korean patent application was filed and its counterpart U.S. patent application has recently been filed with the U.S. Patent and Trademark Office. According to the U.S. Patent law, the inventor is only entitled to be an applicant for a patent application. Therefore, although the right to receive patent has been transferred to our client, UTSK, the U.S. Patent and Trademark Office requires filing of documents as enclosed herewith which must be signed by the inventor.

With regard to the assignment, please be informed that signing the enclosed assignment

GWANG WHA MOON POST OFFICE- CONTENTS CERTIFIED MAIL CERTIFICATE NO. 09033003, 2006-03-08

[Translation]

does not mean that you newly transfer something another to somebody, it merely means confirming that you had already assigned the right to receive patent in 2003. As for the Declaration, the signing the declaration means that you are declaring that you are the true and sole inventor of this invention.

As explained above, I enclose herewith these documents. Please sign and date the marked portions and return them to us via courier, registered mail or whatever is convenient for you. Any costs to be incurred in this connection are surely responsible to our side. Please send us any receipts for payment in return.

Return Address: Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea

Title of Invention: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

-Contact Person: Manager Hee Jae IM / Attorney Jee Hong YOON
-Telephone: 02-2122-3822 / 02-2122-3515
-Mobile: 010-4787-7275
-E-maill: zhjim1@ip.kimchang.com

Attorney Jee Hong YOON (seal)

Enclosure(s)

金 · 張 法律事務所

서울시 종로구 신문로 1가 226 홍국생명빌딩 9층 우편번호 110-786
Website: www.ip.kimchang.com E-Mail: all@ip.kimchang.com
전화: (02) 764-8855 / 2122-3900 Fax: (02) 745-5954 / 741-0328 / 763-7434

2006년 3월 8일

수 신 : 김 준 만 님
경기도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)
E-mail: juneman@saekdong.net
박 노 상 님
경기도 성남시 분당구 야탑동 장미코오롱아파트 120동 201호 (우.463-788)
E-mail: nspark@shinbiro.com

제 목 : 미국 특허청 제출용 서명서류 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : GP048360

귀하의 사업에 무궁한 발전을 기원합니다.

당소는 유티스타콤 코리아 유한회사의 대리인인 김&장 특허법률사무소 입니다.

귀하께서는 2003년도에 현대전자산업 주식회사/현대시스콤 재직 중에 개발하신 아래의 발명에 대한 권리를 당시 소속회사의 직무발명 양도규정에 따라 소속회사에 양도하였으며, 현재 이 발명에 대해 특허를 받을 수 있는 권리는 귀하의 소속회사로부터 당소의 의뢰인인 유티스타콤 코리아 유한회사로 이전되어 있는 상태에 있습니다. 이 발명에 대하여는 한국 특허출원을 하고 이어서 현재 미국 특허출원을 진행 중에 있는데, 미국의 특허제도에 따르면 출원시 발명자가 출원인이 되어야 하기 때문에 미국 특허청은 특허를 받을 수 있는 권리가 당소의 의뢰인에게 있다 하더라도 첨부된 바와 같은 서류에 출원인으로서 발명자가 직접 서명한 후 이를 제출하도록 요구하고 있습니다.

첨부된 서류 중 양도증(assignment)과 관련해서는, 귀하께서 이미 이 발명에 대한 권리를 양도한 상태이기 때문에 첨부된 양도증은 이를 확인하는 절차에 불과하며 새로이 무언가를 양도하는 것은 아님을 알려드립니다. 발명자 선언서(declaration)는 귀하께서 이 발명의 발명자임을 선서하는 내용으로 되어 있습니다.

이와 같은 사정으로 첨부 서류를 보내드리오니 서명 후 당소로 반송하여 주시기를 부탁드립

이 우편물은 2006-03-08 제 09033003
호에 의하여 내용증명우편물로
발송하였음을 증명함
광화문 우체국장

니다. 반송은 퀵서비스(착불) 등 귀하께서 편한 방법으로 아래의 당소 주소로 해 주시고 어떤 경우에든 당소에서 비용을 부담할 것이오니 비용 영수증 등도 함께 반송하여 주시면 감사하겠습니다.

반송 주소: 서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 김.장특허법률사무소
(우편번호 110-786)

발명의 명칭: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

-담당자: 임 희 재 차장/ 윤 지 홍 변리사
-전화: 02-2122-3822 / 02-2122-3515
-Mobile: 010-4787-7275
-E-maill: zhjim1@ip.kimchang.com

변리사 윤 지 홍

첨부있음.

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

the specification of which is attached hereto unless the following space is checked:

☒ was filed on December 13, 2005 as United States Application Serial Number 10/560,664.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 (including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s):

	Number	Country	Day/Month/Year Filed
1.	PCT/KR2004/001851	PCT	23 July 2004
2.	10-2003-0050916	Korea	24 July 2003

I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and I direct that all correspondence be addressed to that Customer Number.

Customer Number: 020306
Principal attorney or agent: Robert J. Irvine, III
Telephone number: 312-913-0001

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

Full name of first inventor: June Man KIM

Inventor's signature: _____ Date: _____

Residence: Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

Citizenship: Republic of Korea

Post Office Address: Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

Full name of second inventor: Noh Sang PARK

Inventor's signature: _____ Date: _____

Residence: Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Citizenship: Republic of Korea

Post Office Address: Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

ASSIGNMENT

Case No.: 05-597-B Serial No.: 10/560,664
Inventors: June Man KIM, Noh Sang PARK
Date of Execution
of Application: Filing Date: December 13, 2005

In consideration of One Dollar ($1.00) and other good and valuable considerations in hand paid, the receipt and sufficiency whereof are hereby acknowledged, the undersigned hereby assign to:

UTSTARCOM KOREA LIMITED

its successors and assigns, the entire right, title and interest in the invention or improvements of the undersigned disclosed in an application for Letters Patent of the United States, entitled:

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

and identified as:

Case No. 05-597-B

in the offices of McDONNELL BOEHNEN HULBERT & BERGHOFF LLP and in said application and any and all other applications, both United States and foreign, which the undersigned may file, either solely or jointly with others, on said invention or improvements, and in any and all Letters Patent of the United States and foreign countries, which may be obtained on any of said applications, and in any reissue or extension of such patents, and further assigns to said assignee the priority right provided by the International Convention.

The undersigned hereby authorize and request the Commissioner of Patents and Trademarks to issue said Letters Patent to said assignee.

The undersigned hereby authorize and request the attorneys of record in said application to insert in this assignment the filing date and serial number of said application when officially known, and the date of execution of the application.

The undersigned warrant themselves to be the owners of the entire right, title and interest in said invention or improvements and to have the right to make this assignment, and further warrant that there are no outstanding prior assignments, licenses, or other encumbrances on the interest herein assigned.

...3.3.8
21104

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

For said considerations the undersigned hereby agree, upon the request and at the expense of said assignee, its successors and assigns, to execute any and all divisional, continuation and substitute applications for said invention or improvements, and any necessary oath, affidavit or declaration relating thereto, and any application for the reissue or extension of any Letters Patent that may be granted upon said application and any and all applications and other documents for Letters Patent in foreign countries on said invention or improvements, that said assignee, its successors or assigns may deem necessary or expedient, and for the said considerations the undersigned authorize said assignee to apply for patents for said invention or improvements in its own name in such countries where such procedure is proper and further agree, upon the request of said assignee, its successors and assigns, to cooperate to the best of the ability of the undersigned with said assignee, its successors and assigns, in any proceedings or transactions involving such applications or patents, including the preparation and execution of preliminary statements, giving and producing evidence, and performing any and all other acts necessary to obtain, maintain and enforce said Letters Patent, both United States and foreign, and vest all rights therein hereby conveyed in the assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by the said assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made.

WITNESS my hand and seal this _____ day of _____, 2006.

_____
June Man KIM

State of

County of

The foregoing instrument was acknowledged before me this _____ day of

_____, _____ by _____.

_____
NOTARY PUBLIC

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

WITNESS my hand and seal this ___ day of _____, 2006.

_____
Noh Sang PARK

State of

County of

The foregoing instrument was acknowledged before me this _____ day of

_____, _____by _____.

_____
NOTARY PUBLIC

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

직무 발명 신고서

신고일:2003년4 월 30일

발명팀	결재	업무코드		승인권자	현장관리팀	검토	특허팀	결재	업무코드		승인권자
		주발명자	검토	부서장					기안	검토	승인
	직위/성명	GJ/박노상	BJ/김준만	ES/이연범		/		직위/성명			/
	일 자	05월 12일			관리번호			일 자			
	보존년한	0,1,2,3,5,10,영구						보존년한	1,3,5,10,영구	보안등급	1,2,3 대외비

사내 직무발명 보상 규정에 의거하여 출원/등록을 의뢰하며,국내/외 등록권리를 양도합니다.

발명자 기재사항

발명의 명칭	기지국 Beacon를 이용한 위치추적 장치 및 Handover보조 장치
발명의 개요	CDMA 기지국에서 보내오는 신호중 Pilot신호를 축출하여 동기신호로 다시 이용하고 임의의 기지국 구별 PN 값으로 신호를 발생하는 장치 따라서 본 발명은 기존의 장치 혹은 구조에서 필요 없는 부분을 제거하여 및 간략화을 통하여 필요한 장소에만 본 발명의 장치를 사용 함 또한 기존의 Beacon도 이용하여 위치추적등에 정밀도을 향상하는 형태의 방식의 새로운 알고리즘으로 접근 처리하여 위치 추적에 정밀도를 향상하였다.
관련PROJECT명	CDMA 위치 장치 Sprint
실 시 상 황	☐착상 ☐설계완료 ☐시험(중,완료) ☐사업화(준비중,실시중)
본발명의 발표상황	☐미발표 ☐ 발표예정 ☐ 旣발표 ※旣발표 또는 발표 예정인 경우 발표(예정)일과 관련논문등 기입 요망 [발표(예정)일:200 년 월 일, 관련논문:]
선행특허자료	국 내 / 외 국
출원완급	☐ 보 통 ☑ 지 급-->(일이내) 지급출원 이 유
외국출원	☑유 (이유:) ☐ 무
KEY WORD	

특허팀 기재사항

접 수 일	2003년 5월13일	대리인	대나스	전담자관리번호	CM2003-05-060
국내출원	☑ 특허 ☐ 실용 ☐ 공개기보 ☐ 출원보류(이유:)				
	심사청구	☐ 유 ☐ 무	전략특허PROJECT명	22	
외국출원	☐ 유 ☐ 무		출원등급		
	심의여부	☐ 유 ☐ 무	*대리인 특허명세서작성 참조사항*		

출원국가선정				
☐개별국출원 ☐ EPO출원 ☐ PCT출원				
1순위		5순위		
2순위		6순위		
3순위		7순위		
4순위		8순위		
비고				

☐사무소 자체 국내출원 ☐특허팀검토후 국내출원
☑국내외 동시출원

검토의견: 자동 및 국내외 동시출원요망.

HYUNDAI

US 10/560,664
DOC. 1-10

발명팀장 기재사항

< 발명 평가내용 >

구 분	내 용	평가점수
기 술 성	단순 조합 기술임	☐ 1점
	약간 높은 수준을 요하는 기술임	☐ 3점
	고도의 수준을 요하는 기술임	☑ 5점
실현가능성	이론상 실현은 가능하나, 실험계획은 없슴	☐ 1점
	테스트 하려면 관련기술의 발전이 요구됨	☐ 2점
	테스트중이거나 예정임	☐ 3점
	양호한 테스트 결과 얻음(자료첨부 가능)	☐ 5점
	현재 사업화 준비중 또는 실시중임	☑ 7점
효 과	개선된 효과의 수준은? (공정 단순화, Yield, Cost 등의 측면)	☑ 3점 ☐ 2점 ☐ 1점
발명중요도	기술공개로 타사 권리확보를 방어하는 수준임	☐ 1점
	양산에 적용(예정) 가능한 발명임	☐ 3점
	반드시 필요한 독점 기술임	☑ 5점
평가결과		(20) 점

주)※상기 발명 평가표는 반드시 팀장이 직접 기재하시기 바랍니다.
※"실현가능성"란에서 5점,7점에 해당된 발명은 증빙 자료가 반드시 필요 합니다.
※평가를 완료하신후 평가결과를 기입 바랍니다.

< 외국출원 평가내용 >

발명의 적용제품 현황	*적용제품: CDMA LBS system *관련기술: *적용시기: 즉시	*복수제품에 적용되는 경우 전부 기재하시기 바라며, 향후 적용 제품경우 예상시점을 기재요망

평가내용		출원희망국가	
	☑ 절대 필요 ☐ 국내출원후 1년간 관망 ☐ 필요 없음	1순위	한
		2순위	국
		3순위	일본
	☐ 개별국출원, ☐ EPO출원, ☐ PCT출원	4순위	호주
	기술적측면 미국 SPCS 등 사업자와 BMT 및 proven trial 실시	5순위	중국
		6순위	
		7순위	
		8순위	
	경제적측면 LBS 시장 확대에 따른 LBS solution 제품 매출 기대.	평가자	
		성명:	김준모
		직위:	[illegible]
		서명:	[signature]

권덕열

발명자 인적사항	주발명자	성명	(한글) 김준만	미주영업					
			(한문) 金峻萬	직위	부장	사번	H01543	TEL (8071)	
			(영문) JUNEMAN KIM	주민등록No	- 600306-[redacted]			기여도	%
		E-mail	juneman@hysyscomm.com	주소	(-)경기성남분당구미동신한303-401			서 명	
	공동 발명자	성명	(한글) 박노상	미주영업					
			(한문) 朴魯祥	직위	과장	사번	H13814	TEL (8071)	
			(영문) NOHSANG PARK	주민등록No	690322-[redacted]			기여도	%
		E-mail	pns@hysyscomm.com	주소	(-)경기성남분당구장미코오롱120-201			서 명	
		성명	(한글)		SBU/BU		TEAM		PART
			(한문)	직위		사번		TEL ( )	
			(영문)	주민등록No	-			기여도	%
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		성명	(한글)		SBU/BU		TEAM		PART
			(한문)	직위		사번		TEL ( )	
			(영문)	주민등록No	-			기여도	%
		E-mail		주소	(-)			서 명	
		성명	(한글)		SBU/BU		TEAM		PART
			(한문)	직위		사번		TEL ( )	
			(영문)	주민등록No	-			기여도	%
		E-mail		주소	(-)			서 명	
		성명	(한글)		SBU/BU		TEAM		PART
			(한문)	직위		사번		TEL ( )	
			(영문)	주민등록No	-			기여도	%
		E-mail		주소	(-)			서 명	

㈜1.주소는 상세히 기재하시고, E-mail은 반드시 기재하시기 바람.
2.영문기재시 Fullname을 기재하시기 바람.
3.공동발명인경우 발명자별 기여도를 반드시 기재하시기 바람.(기여도합은 반드시 100%로 기재)

발명의 명세서

1. 발명의 명칭

발명의 실질적 내용에 대해 가장 적절히 표현할수 있는 명칭을 간결하고 명확하게 기재하되, 약자는 가급적 피해주시기 바람.

기지국 Beacon를 이용한 위치추적 장치 및 Handover 보조 장치

2. 발명의 상세한 설명

1)산업상의 이용분야

발명이 무엇에 관한 것이며,어느 기술분야에 적용되는지를 기재하고,타 기술 분야에서도 활용이 가능하면 그 기술분야도 기재하시기 바람.

정밀 위치 추적 및 기지국 간 Handover를 필요로 하는 분야에 사용 함

2)종래기술의 설명 및 그 문제점

*본 발명이 속하는 기술분야에서 본 발명과 연관되는 종래기술이 어떻게 실시되는지 기술적 구성이나 개요를 비교적 상세히 설명하고,그 문제를 기재하기 바람.
*본 발명과 관련된 참고문헌이나 특허공보가 있으면 문헌명이나 공보번호를 기재하고, 그 자료를 본 명세서에 첨부하시기 바람.

위치 추적의 방식은 단말기내의 GPS기능를 이용하는 방식과 Network 방식에서 위치를 추적하는 방식을 사용한다. 이 경우 도심에서의 여러 환경은 위의 두가지 방식에 정밀도를 낮추게 된다. 이러한 상황에서 위치기반 부가 써비스는 한계와 어려움이 생긴다. 따라서 CDMA시스템에서는 더욱 정밀하고, 신뢰 할수있는 위치 추적 방식을 요구 하게 된다. 따라서 본 발명은 현존하는 시스템의 약점을 보완 하는 방식으로 접근한다. 위치추적의 정밀도을 약화시키는 문제점은 중계기의 지연에 의한 왜곡(Network 방식) 및 하늘이 볼수 없는 건물및 지하에서 단말기내의 GPS수신기가 위성신호를 수신하지 못하거나 일부 만을 수신하게되어 (4개이상의 GPS 신호를 받아야 위치를 판단 가능 함) 위치 추적의 정밀도를 낮추게 된다. 추가적으로 기지국의 Cell ID 방식은 기지국의 전파 반경에 좌우 되므로 오차가 많아서 위치추적에는 한계가 있는 정밀도만 갖고 있음. 본 발명은 이러한 단점을 보완 하고저 새로운 알고리즘으로 접근하여 극복하였다.

3)종래 문제점을 해결하기 위한 본 발명의 기술적 원리

*본 발명에서 상기와 같은 기술적 문제점을 어떻게 해결하고 있는지 그 해결책의 요지만을 기재하고, 그 상세한 설명은 다음항에 기재하기 바람.
*어떤 효과를 지닌 어떤기술을 사용하여 어떤 문제점을 해결하였다는 등

본 발명의 알고리즘은 CDMA에서 사용하는 Neighbor List(PN: 이웃한 기지국의 정보)을 이용하는 방식이다. 이는 기지국의 전파에서 Pilot 신호를 축출하여 다시 임의의 시간 후에 신호를 발생하므로 써 가상의 PN를 이용하여 Handset이 임의의 위치 내에 있음을 감지하여(PSMM : CDMA 표준 신호처리 메시지에서 감지하는 방식) 오차의 범위를 작게 하는 방식. 여기서 전파에서 Pilot신호를 축출하는 방식 외에 일반적인 (SKT, KTF의 Beacon 방식의 장치)Beacon장치 또한 이용할 수 있음. 이러한 알고리즘을 이용한 위치추적은 구현시 경제적인 방안도 고려하여야 하기 때문에 기지국 전파에서 Pilot신호를 추출하여 임의의 PN 발생 장치를 우선적으로 구현하며, 이 기능은 단독으로 사용시 Handover 보조 장치로 이용이 가능하다.

4)본 발명의 구성 및 그 전반적인 동작설명

*본 발명은 본 발명이 속하는 기술분야 또는 연관된 기술분야에 종사하는 기술자라면 누구라도 실시할 수 있을 정도로 상세하고도 정확한 표현으로 기재하시기 바람.

CDMA 시스템은 Handset의 Hand-over가 중요한 장점 중에 하나이다. 이러한 장점을 이용하는 데에 몇 가지 방안 중 Beacon이라는 방안이 있다. Beacon방식은 Handover지점에서 Handset(MS: mobile Station)이 시스템으로 전송하는 Message내에서 Beacon에 의한 가상의 PN을 찾아 봄으로써 Handover를 결정하는데 사용되며, 현재 SKT, KTF에서 사용 중에 있다. 이러한 속성을 이용하여 우리가 필요로 하는 Beacon을 기지국의 전파내(cell 내부)혹은 중계기 내에서 활용하는 방식으로 기존의 Beacon등을 이용하여 MS가 Beacon의 신호영역내에 있는지를 판단하도록 PSMM(기지국의 신호등을 단말기가 축출한 정보 Message)에 인접 기지국의 정보를 기지국으로 송신할 때 Beacon 기지국 정보를 함께 송신 함으로써 위치추적을 할 수 있도록 하는 방식으로 Beacon를 구현하는 여러 방식 중에 현재 시스템에서 사용중인 Beacon 방식과 기지국에서 보내온 전파신호 중에 Pilot신호를 축출하여 임의의 Pilot신호(기지국 구별 신호)를 발생 하는 Beacon 방식을 모두 사용하도록 하는 알고리즘.

4) 항에서 계속

5)본 발명의 다른 실시예

4)항에 기재된 본 발명의 주요 실시예 이외에 다른 실시예가 있으면 도면을 도시하고, 그 내용을 실시할 수 있을 정도로 구체화 하여 기재.

6)본 발명의 효과

본 발명과 종래기술과의 구성 및 동작의 차이에서 오는 효과를 구체적으로 기재하고,부수적으로 발생되는 이점도 기재하나,단 기술적인 근거가 없는 막연한 경제적 효과 등은 기재 불필요.

본 발명은 기존의 부정확한 위치추적 알고리즘을 개선하여 정밀하고, 신속한 위치을 알아내는데 있다. 따라서 이러한 기술은 위치추적 기술을 미래의 무한한 가치 창조가 예상되는 분야에 응용되는 기술이다.

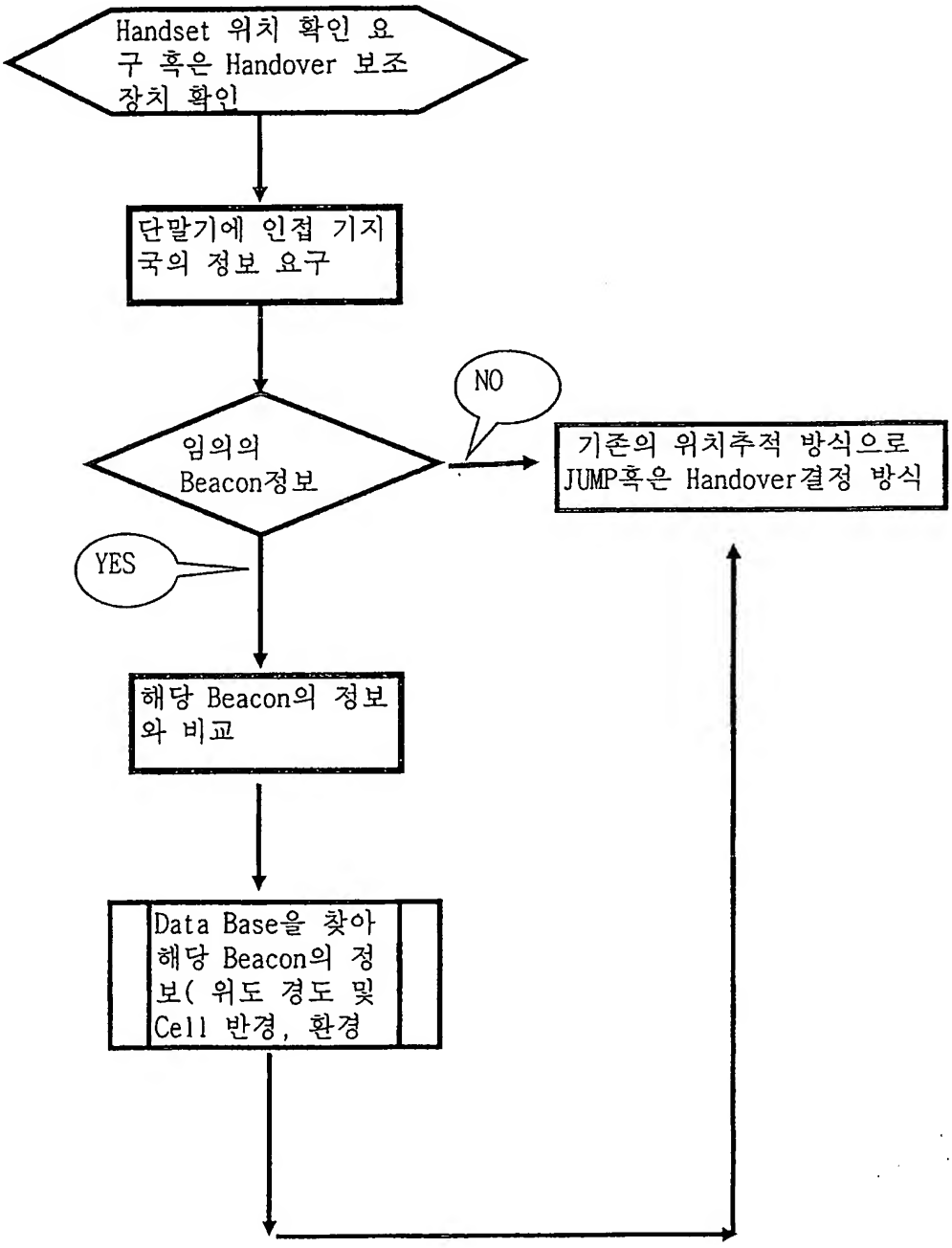
3. 발명의 권리보호 범위

본 항은 발명의 명세서에 기재된 내용중 권리로서 보호 받고자 하는 사항을 기재하되, 본 발명에 의해 새롭게 창작된 구성 혹은 기능만을 기재함.특히,그중 보호를 받아야할 부분이나, 또 다른 실시예가 있는 경우 이를 다른 항으로 명확하고,간결하게 기재하시기 바람.

본 발명은 (1) 기지국에 Handover에 이용되는 Beacon를 이용한 위치추적 (2)그리고 Beacon 장치에 기존의 Baecon을 이용한 위치추적외에 (3) 기지국 전파에서 Piolt신호 및 동기 신호를 축출하여 새로운 임의의 기지국 신호를 만드는 Beacon를 갖고 Handove 및 위치을 파악하는데 이용하는 방안 알고리즘과 그의 구조

4. 도면의 간단한 설명

※도면의 도시된 내용에 따라 발명자가 의도했던 내용이 변할수 있으므로 본 발명서에 필요한 도면을 정확하게 표시하여,명세서 뒤에 반드시 첨부하시기 바람.
※ ①전자전기회로 관련 출원은 회로도,블록도,FLOW CHART,특성그래프 등이 첨부되어야함.
②기계관련 출원은 전체 구조도,상세 구조도,투시도 등이 첨부되어야 하며,
③공정관련 출원은 전체공정 계통도와 상세공정도 및 특성그래프 등이 첨부되어야 함.
※본 항에 예를들에 "제1도는 XXX 회로도,제2도는 ...소자의 단면도…,"와 같이 기재바람.
※도면의 필요한 부분에 대해서는 그 명칭을 본 항 하단부 아래에 기재하시기 바람.
(<예>1:제어부 2:감지부)



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서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
Website: www.ip.kimchang.com E-Mail: all@ip.kimchang.com
전화: (02) 764-8855 / 2122-3900 Fax: (02) 745-5954 / 741-0328 / 763-7434

2006년 3월 8일

수 신 : 김 준 만 님
경기도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)
E-mail: juneman@saekdong.net
박 노 상 님
경기도 성남시 분당구 야탑동 장미코오롱아파트 120동 201호 (우.463-788)
E-mail: nspark@shinbiro.com
제 목 : 미국 특허청 제출용 서명서류 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : GP048360

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귀하께서는 2003년도에 현대전자산업 주식회사/현대시스콤 재직 중에 개발하신 아래의 발명에 대한 권리를 당시 소속회사의 직무발명 양도규정에 따라 소속회사에 양도하였으며, 현재 이 발명에 대해 특허를 받을 수 있는 권리는 귀하의 소속회사로부터 당소의 의뢰인인 유티스타콤 코리아 유한회사로 이전되어 있는 상태에 있습니다. 이 발명에 대하여는 한국 특허출원을 하고 이어서 현재 미국 특허출원을 진행 중에 있는데, 미국의 특허제도에 따르면 출원시 발명자가 출원인이 되어야 하기 때문에 미국 특허청은 특허를 받을 수 있는 권리가 당소의 의뢰인에게 있다 하더라도 첨부된 바와 같은 서류에 출원인으로서 발명자가 직접 서명한 후 이를 제출하도록 요구하고 있습니다.

첨부된 서류 중 양도증(assignment)과 관련해서는, 귀하께서 이미 이 발명에 대한 권리를 양도한 상태이기 때문에 첨부된 양도증은 이를 확인하는 절차에 불과하며 새로이 무언가를 양도하는 것은 아님을 알려드립니다. 발명자 선언서(declaration)는 귀하께서 이 발명의 발명자임을 선서하는 내용으로 되어 있습니다.

이와 같은 사정으로 첨부 서류를 보내드리오니 서명 후 당소로 반송하여 주시기를 부탁드립

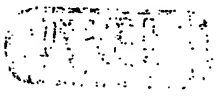
이 우편물은 2006-03-08 제 09033004
호에 의하여 내용증명우편물로
발송하였음을 증명함
광화문 우체국장

니다. 반송은 퀵서비스(착불) 등 귀하께서 편한 방법으로 아래의 당소 주소로 해 주시고 어떤 경우에든 당소에서 비용을 부담할 것이오니 비용 영수증 등도 함께 반송하여 주시면 감사하겠습니다.

반송 주소: 서울시 종로구 신문로 1가 226 홍국생명빌딩 9층 김.장특허법률사무소
(우편번호 110-786)

발명의 명칭: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

-담당자: 임 희 재 차장/ 윤 지 홍 변리사
-전화: 02-2122-3822 / 02-2122-3515
-Mobile: 010-4787-7275
-E-maill: zhjim1@ip.kimchang.com

변리사 윤 지 홍 

첨부있음.

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

the specification of which is attached hereto unless the following space is checked:

☒ was filed on December 13, 2005 as United States Application Serial Number 10/560,664.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 (including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s):

	Number	Country	Day/Month/Year Filed
1.	PCT/KR2004/001851	PCT	23 July 2004
2.	10-2003-0050916	Korea	24 July 2003

I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and I direct that all correspondence be addressed to that Customer Number.

Customer Number: **020306**
Principal attorney or agent: Robert J. Irvine, III
Telephone number: 312-913-0001

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

Full name of first inventor: June Man KIM

Inventor's signature: _____ Date: _____

Residence:	Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea
Citizenship:	Republic of Korea
Post Office Address:	Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

Full name of second inventor: Noh Sang PARK

Inventor's signature: _____ Date: _____

Residence: Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Citizenship: Republic of Korea

Post Office Address: Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

ASSIGNMENT

Case No.: 05-597-B
Serial No.: 10/560,664
Inventors: June Man KIM, Noh Sang PARK
Date of Execution
of Application:
Filing Date: December 13, 2005

In consideration of One Dollar ($1.00) and other good and valuable considerations in hand paid, the receipt and sufficiency whereof are hereby acknowledged, the undersigned hereby assign to:

UTSTARCOM KOREA LIMITED

its successors and assigns, the entire right, title and interest in the invention or improvements of the undersigned disclosed in an application for Letters Patent of the United States, entitled:

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

and identified as:

Case No. 05-597-B

in the offices of McDONNELL BOEHNEN HULBERT & BERGHOFF LLP and in said application and any and all other applications, both United States and foreign, which the undersigned may file, either solely or jointly with others, on said invention or improvements, and in any and all Letters Patent of the United States and foreign countries, which may be obtained on any of said applications, and in any reissue or extension of such patents, and further assigns to said assignee the priority right provided by the International Convention.

The undersigned hereby authorize and request the Commissioner of Patents and Trademarks to issue said Letters Patent to said assignee.

The undersigned hereby authorize and request the attorneys of record in said application to insert in this assignment the filing date and serial number of said application when officially known, and the date of execution of the application.

The undersigned warrant themselves to be the owners of the entire right, title and interest in said invention or improvements and to have the right to make this assignment, and further warrant that there are no outstanding prior assignments, licenses, or other encumbrances on the interest herein assigned.

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

For said considerations the undersigned hereby agree, upon the request and at the expense of said assignee, its successors and assigns, to execute any and all divisional, continuation and substitute applications for said invention or improvements, and any necessary oath, affidavit or declaration relating thereto, and any application for the reissue or extension of any Letters Patent that may be granted upon said application and any and all applications and other documents for Letters Patent in foreign countries on said invention or improvements, that said assignee, its successors or assigns may deem necessary or expedient, and for the said considerations the undersigned authorize said assignee to apply for patents for said invention or improvements in its own name in such countries where such procedure is proper and further agree, upon the request of said assignee, its successors and assigns, to cooperate to the best of the ability of the undersigned with said assignee, its successors and assigns, in any proceedings or transactions involving such applications or patents, including the preparation and execution of preliminary statements, giving and producing evidence, and performing any and all other acts necessary to obtain, maintain and enforce said Letters Patent, both United States and foreign, and vest all rights therein hereby conveyed in the assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by the said assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made.

WITNESS my hand and seal this _____ day of _____, 2006.

_____
June Man KIM

State of

County of

The foregoing instrument was acknowledged before me this _____ day of

_____, _____ by _____.

_____
NOTARY PUBLIC

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

WITNESS my hand and seal this ___ day of _____, 2006.

_____
Noh Sang PARK

State of

County of

The foregoing instrument was acknowledged before me this _____ day of

_____, _____by _____.

_____
NOTARY PUBLIC

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

직무 발명 신고서

신고일:2003년4 월 30일

발명팀	결재	업무코드		승인권자	현장관리팀	검토	특허팀	결재	업무코드		승인권자
		주발명자	검토	부서장					기안	검토	승인
	직위/성명	GJ/박노상	BJ/김준만	ES/이연범		/		직위/성명			/
	일 자	05월 12일			관리번호			일 자			
	보존년한	0,1,2,3,5,10,영구						보존년한	1,3,5,10,영구	보안등급	1,2,3 대외비

사내 직무발명 보상 규정에 의거하여 출원/등록을 의뢰하며,국내/외 등록권리를 양도합니다.

발명자 기재사항

발명의 명칭	기지국 Beacon를 이용한 위치추적 장치 및 Handover보조 장치
발명의 개요	CDMA 기지국에서 보내오는 신호중 Pilot신호를 축출하여 동기신호로 다시 이용하고 임의의 기지국 구별 PN 값으로 신호를 발생하는 장치 따라서 본 발명은 기존의 장치 혹은 구조에서 필요 없는 부분을 제거하여 및 간략화을 통하여 필요한 장소에만 본 발명의 장치를 사용 함 또한 기존의 Beacon도 이용하여 위치추적등에 정밀도을 향상하는 형태의 방식의 새로운 알고리즘으로 접근 처리하여 위치 추적에 정밀도를 향상하였다.
관련PROJECT명	CDMA 위치 장치 Sprint
실 시 상 황	☐착상 ☐설계완료 ☐시험(중,완료) ☐사업화(준비중,실시중)
본발명의 발표상황	☐미발표 ☐ 발표예정 ☐ 旣발표 ※旣발표 또는 발표 예정인 경우 발표(예정)일과 관련논문등 기입 요망 [발표(예정)일:200 년 월 일, 관련논문:]
선행특허자료	국 내 / 외 국
출원완급	☐ 보 통 ☑ 지 급-->(____ 일이내) / 지급출원 이 유
외국출원	☑유 (이유:) ☐ 무
KEY WORD	

특허팀 기재사항

접 수 일	2003년 5월13일	대리인	피세스	전담자관리번호	CM2003-05-060
국내출원	☑ 특허 ☐ 실용 ☐ 공개기보 ☐ 출원보류(이유:)				
	심사청구	☐ 유 ☐ 무	전략특허PROJECT명	22	
외국출원	☐ 유 ☐ 무		출원등급		
	심의여부	☐ 유 ☐ 무	*대리인 특허명세서작성 참조사항*		

출원국가선정					검토의견
☐개별국출원 ☐ EPO출원 ☐ PCT출원					☐사무소 자체 국내출원 ☐특허팀검토후 국내출원 ☑국내외 동시출원
1순위		5순위			자동 및 국내외 동시출원임.
2순위		6순위			
3순위		7순위			
4순위		8순위			
비고					

HYUNDAI

발명팀장 기재사항

< 발명 평가내용 >

구 분	내 용	평가점수
기 술 성	단순 조합 기술임	☐ 1점
	약간 높은 수준을 요하는 기술임	☐ 3점
	고도의 수준을 요하는 기술임	☑ 5점
실현가능성	이론상 실현은 가능하나, 실험계획은 없슴	☐ 1점
	테스트 하려면 관련기술의 발전이 요구됨	☐ 2점
	테스트중이거나 예정임	☐ 3점
	양호한 테스트 결과 얻음(자료첨부 가능)	☐ 5점
	현재 사업화 준비중 또는 실시중임	☑ 7점
효 과	개선된 효과의 수준은? (공정 단순화, Yield, Cost 등의 측면)	☑ 3점 ☐ 2점 ☐ 1점
발명중요도	기술공개로 타사 권리확보를 방어하는 수준임	☐ 1점
	양산에 적용(예정) 가능한 발명임	☐ 3점
	반드시 필요한 독점 기술임	☑ 5점
평가결과		(20) 점

주)※상기 발명 평가표는 반드시 팀장이 직접 기재하시기 바랍니다.
※"실현가능성"란에서 5점,7점에 해당된 발명은 증빙 자료가 반드시 필요 합니다.
※평가를 완료하신후 평가결과를 기입 바랍니다.

< 외국출원 평가내용 >

발명의 적용제품 현 황	*적용제품: cdma UBS system *관련기술: *적용시기: 즉시	*복수제품에 적용되는 경우 전부 기재하시기 바라며, 향후 적용 제품경우 예상시점을 기재요망
평가내용	☑ 절대 필요 ☐ 국내출원후 1년간 관망 ☐ 필요 없음 ☐ 개별국출원, ☐ EPO출원, ☐ PCT출원	출원희망국가 1순위 한국 2순위 중국 3순위 일본 4순위 호주 5순위 홍콩 6순위 7순위 8순위
	기술적측면 미국 3PCS등 사업자와 BTC 및 proven trial 실시	
	경제적측면 UBS 시장확대에 따른 UBS solution 제품 매출 기대.	평가자 성명: 김준태 직위: 팀장 서명:

권덕열

발명자 인적사항	주발명자	성명	(한글) 김준만		미주영업					
			(한문) 金峻萬		직위	부장	사번	H01543	TEL (8071)	
			(영문) JUNEMAN KIM		주민등록No	600306-[redacted]			기여도	%
		E-mail	juneman@hysyscomm.com	주소	(-)경기성남분당구미동신한303-401				서 명	
	공동 발명자	성명	(한글) 박노상		미주영업					
			(한문) 朴魯祥		직위	과장	사번	H13814	TEL (8071)	
			(영문) NOHSANG PARK		주민등록No	690322-[redacted]			기여도	%
		E-mail	pns@hysyscomm.com	주소	(-)경기성남분당구장미코오롱120-201				서 명	
		성명	(한글)				SBU/BU		TEAM	PART
			(한문)		직위		사번		TEL ( )	
			(영문)		주민등록No	-			기여도	%
		E-mail		주소	(-)				서 명	
		성명	(한글)				SBU/BU		TEAM	PART
			(한문)		직위		사번		TEL ( )	
			(영문)		주민등록No	-			기여도	%
		E-mail		주소	(-)				서 명	
		성명	(한글)				SBU/BU		TEAM	PART
			(한문)		직위		사번		TEL ( )	
			(영문)		주민등록No	-			기여도	%
		E-mail		주소	(-)				서 명	
		성명	(한글)				SBU/BU		TEAM	PART
			(한문)		직위		사번		TEL ( )	
			(영문)		주민등록No	-			기여도	%
		E-mail		주소	(-)				서 명	

㈜1.주소는 상세히 기재하시고, E-mail은 반드시 기재하시기 바람.
2.영문기재시 Fullname을 기재하시기 바람.
3.공동발명인경우 발명자별 기여도를 반드시 기재하시기 바람.(기여도합은 반드시 100%로 기재)

발명의 명세서

1. 발명의 명칭

발명의 실질적 내용에 대해 가장 적절히 표현할수 있는 명칭을 간결하고 명확하게 기재하되, 약자는 가급적 피해주시기 바람.

기지국 Beacon를 이용한 위치추적 장치 및 Handover 보조 장치

2. 발명의 상세한 설명

1)산업상의 이용분야

발명이 무엇에 관한 것이며,어느 기술분야에 적용되는지를 기재하고,타 기술 분야에서도 활용이 가능하면 그 기술분야도 기재하시기 바람.

정밀 위치 추적 및 기지국 간 Handover를 필요로 하는 분야에 사용 함

2)종래기술의 설명 및 그 문제점

*본 발명이 속하는 기술분야에서 본 발명과 연관되는 종래기술이 어떻게 실시되는지 기술적 구성이나 개요를 비교적 상세히 설명하고,그 문제를 기재하기 바람.
*본 발명과 관련된 참고문헌이나 특허공보가 있으면 문헌명이나 공보번호를 기재하고, 그 자료를 본 명세서에 첨부하시기 바람.

위치 추적의 방식은 단말기내의 GPS기능를 이용하는 방식과 Network 방식에서 위치를 추적하는 방식을 사용한다. 이 경우 도심에서의 여러 환경은 위의 두가지 방식에 정밀도를 낮추게 된다. 이러한 상황에서 위치기반 부가 써비스는 한계와 어려움이 생긴다. 따라서 CDMA시스템에서는 더욱 정밀고 신뢰 할수있는 위치 추적 방식을 요구 하게 된다. 따라서 본 발명은 현존하는 시스템의 약점을 보완 하는 방식으로 접근한다. 위치추적의 정밀도을 약화시키는 문제점은 중계기의 지연에 의한 왜곡(Network 방식) 및 하늘이 볼수 없는 건물및 지하에서 단말기내의 GPS수신기가 위성신호를 수신하지 못하거나 일부 만을 수신하게되어 (4개이상의 GPS 신호를 받아야 위치를 판단 가능 함) 위치 추적의 정밀도를 낮추게 된다. 추가적으로 기지국의 Cell ID 방식은 기지국의 전파 반경에 좌우 되므로 오차가 많아서 위치추적에는 한계가 있는 정밀도 만 갖고 있음. 본 발명은 이러한 단점을 보완 하고저 새로운 알고리즘으로 접근하여 극복하였다.

3)종래 문제점을 해결하기 위한 본 발명의 기술적 원리

*본 발명에서 상기와 같은 기술적 문제점을 어떻게 해결하고 있는지 그 해결책의 요지만을 기재하고, 그 상세한 설명은 다음항에 기재하기 바람.
*어떤 효과를 지닌 어떤기술을 사용하여 어떤 문제점을 해결하였다는 등

본 발명의 알고리즘은 CDMA에서 사용하는 Neighbor List(PN: 이웃한 기지국의 정보)을 이용하는 방식이다. 이는 기지국의 전파에서 Pilot 신호를 축출하여 다시 임의의 시간 후에 신호를 발생하므로 써 가상의 PN를 이용하여 Handset이 임의의 위치 내에 있음을 감지하여(PSMM : CDMA 표준 신호처리 메시지에서 감지하는 방식) 오차의 범위를 작게 하는 방식. 여기서 전파에서 Pilot신호를 축출하는 방식 외에 일반적인 (SKT, KTF의 Beacon 방식의 장치)Beacon장치 또한 이용할 수 있음. 이러한 알고리즘을 이용한 위치추적은 구현시 경제적인 방안도 고려하여야 하기 때문에 기지국 전파에서 Pilot신호를 추출하여 임의의 PN 발생 장치를 우선적으로 구현하며, 이 기능은 단독으로 사용시 Handover 보조 장치로 이용이 가능하다.

4)본 발명의 구성 및 그 전반적인 동작설명

*본 발명은 본 발명이 속하는 기술분야 또는 연관된 기술분야에 종사하는 기술자라면 누구라도 실시할 수 있을 정도로 상세하고도 정확한 표현으로 기재하시기 바람.

CDMA 시스템은 Handset의 Hand-over가 중요한 장점 중에 하나이다. 이러한 장점을 이용하는 데에 몇 가지 방안 중 Beacon이라는 방안이 있다. Beacon방식은 Handover지점에서 Handset(MS: mobile Station)이 시스템으로 전송하는 Message내에서 Beacon에 의한 가상의 PN을 찾아 봄으로써 Handover를 결정하는데 사용되며, 현재 SKT, KTF에서 사용 중에 있다. 이러한 속성을 이용하여 우리가 필요로 하는 Beacon을 기지국의 전파내(cell 내부)혹은 중계기 내에서 활용하는 방식으로 기존의 Beacon등을 이용하여 MS가 Beacon의 신호영역내에 있는지를 판단하도록 PSMM(기지국의 신호등을 단말기가 축출한 정보 Message)에 인접 기지국의 정보를 기지국으로 송신할 때 Beacon 기지국 정보를 함께 송신 함으로써 위치추적을 할 수 있도록 하는 방식으로 Beacon를 구현하는 여러 방식 중에 현재 시스템에서 사용중인 Beacon 방식과 기지국에서 보내온 전파신호 중에 Pilot신호를 축출하여 임의의 Pilot신호(기지국 구별 신호)를 발생 하는 Beacon 방식을 모두 사용하도록 하는 알고리즘.

4) 항에서 계속

5)본 발명의 다른 실시예

4)항에 기재된 본 발명의 주요 실시예 이외에 다른 실시예가 있으면 도면을 도시하고, 그 내용을 실시할 수 있을 정도로 구체화 하여 기재.

6)본 발명의 효과

본 발명과 종래기술과의 구성 및 동작의 차이에서 오는 효과를 구체적으로 기재하고,부수적으로 발생되는 이점도 기재하나,단 기술적인 근거가 없는 막연한 경제적 효과 등은 기재 불필요.

본 발명은 기존의 부정확한 위치추적 알고리즘을 개선하여 정밀하고, 신속한 위치을 알아내는데 있다. 따라서 이러한 기술은 위치추적 기술을 미래의 무한한 가치 창조가 예상되는 분야에 응용되는 기술이다.

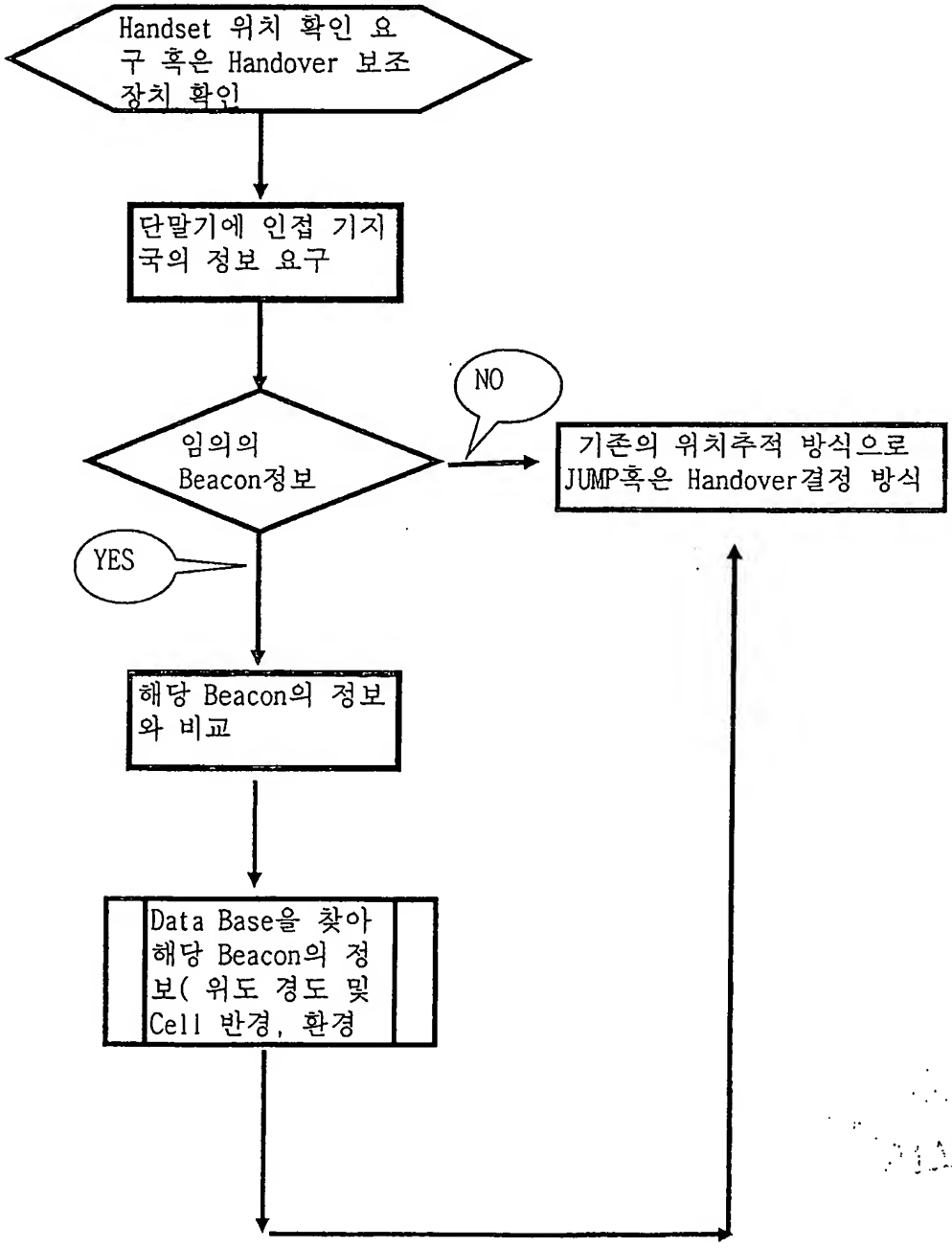
3.발명의 권리보호 범위

본 항은 발명의 명세서에 기재된 내용중 권리로서 보호 받고자 하는 사항을 기재하되, 본 발명에 의해 새롭게 창작된 구성 혹은 기능만을 기재함.특히,그중 보호를 받아야할 부분이나, 또 다른 실시예가 있는 경우 이를 다른 항으로 명확하고,간결하게 기재하시기 바람.

본 발명은 (1) 기지국에 Handover에 이용되는 Beacon를 이용한 위치추적 (2)그리고 Beacon 장치에 기존의 Baecon을 이용한 위치추적외에 (3) 기지국 전파에서 Piolt신호 및 동기 신호를 축출하여 새로운 임의의 기지국 신호를 만드는 Beacon를 갖고 Handove 및 위치을 파악하는데 이용하는 방안 알고리즘과 그의 구조

4. 도면의 간단한 설명

※도면의 도시된 내용에 따라 발명자가 의도했던 내용이 변할수 있으므로 본 발명서에 필요한 도면을 정확하게 표시하여,명세서 뒤에 반드시 첨부하시기 바람.
※ ①전자전기회로 관련 출원은 회로도,블록도,FLOW CHART,특성그래프 등이 첨부되어야함.
②기계관련 출원은 전체 구조도,상세 구조도,투시도 등이 첨부되어야 하며,
③공정관련 출원은 전체공정 계통도와 상세공정도 및 특성그래프 등이 첨부되어야 함.
※본 항에 예를들에 "제1도는 XXX 회로도,제2도는 ...소자의 단면도…,"와 같이 기재바람.
※도면의 필요한 부분에 대해서는 그 명칭을 본 항 하단부 아래에 기재하시기 바람.
(<예>1:제어부 2:감지부)



[Translation]

KIM & CHANG

Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea
Telephone: (822) 764-8855 / 2122-3900 Fax: (822) 741-0328 / 745-5954 / 763-7434
E-Mail: all@ip.kimchang.com

March 8, 2006

To. June Man Kim (e-mail: juneman@saekdong.net)
Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

To. Noh Sang Park (e-mail: nspark@shinbiro.com)
Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Re. Declaration and Power of Attorney and Assignment to be filed with U.S. Patent and Trademark Office (U.S. Serial No. 10/560,664)
K&C Ref.: GP048360

I hope your business is prospering.

I am a patent attorney for a law firm, Kim & Chang, and contacting you on behalf of my client UTStarcom Korea Limited.

You had assigned your invention as identified on the next page to your former company in 2003, which was conceived when you were working for Hyundai Electronics Industries, Co., Ltd./ Hyundai Syscomm, Inc. under the provisions of the employee's invention compensation policy of the company. Therefore, the right to receive patent for the invention was transferred to the former company. Recently, the right to receive patent was transferred to our client, UTStarcom Korea Limited, hereinafter referred to as "UTSK" from your former company. With respect to this invention, a Korean patent application was filed and its counterpart U.S. patent application has recently been filed with the U.S. Patent and Trademark Office. According to the U.S. Patent law, the inventor is only entitled to be an applicant for a patent application. Therefore, although the right to receive patent has been transferred to our client, UTSK, the U.S. Patent and Trademark Office requires filing of documents as enclosed herewith which must be signed by the inventor.

With regard to the assignment, please be informed that signing the enclosed assignment

GWANG WHA MOON POST OFFICE- CONTENTS CERTIFIED MAIL CERTIFICATE NO. 09033004, 2006-03-08

[Translation]

does not mean that you newly transfer something another to somebody, it merely means confirming that you had already assigned the right to receive patent in 2003. As for the Declaration, the signing the declaration means that you are declaring that you are the true and sole inventor of this invention.

As explained above, I enclose herewith these documents. Please sign and date the marked portions and return them to us via courier, registered mail or whatever is convenient for you. Any costs to be incurred in this connection are surely responsible to our side. Please send us any receipts for payment in return.

Return Address: Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea

Title of Invention: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

-Contact Person: Manager Hee Jae IM / Attorney Jee Hong YOON
-Telephone: 02-2122-3822 / 02-2122-3515
-Mobile: 010-4787-7275
-E-maill: zhjim1@ip.kimchang.com

Attorney Jee Hong YOON (seal)

Enclosure(s)

[Translation]

[E-mail to the inventors June Man Kim and Noh Sang Park from K&C staff, Jiwon Lim]

From: zjwlim (Ji-Won Lim)
Date: Mar 9, 2006 2:53 PM
To: juneman@saekdong.net; nspark@shinbiro.com
Cc: zhjim1(Hee-Jae Im); jhyoon (Jee-Hong Yoon)
Subject: [To. Mr. June Man Kim and Mr. Noh Sang Park] An announcement from Law offices of Kim & Chang
Attachment(s): FE241483-JMPNSP-LETTER.pdf; FE241483- JMPNSP –SIGNATURE DOCUMENTS.pdf; FE241483-JMPNSP-ORIGINAL ASSIGNMENT.pdf

To. June Man Kim (e-mail: juneman@saekdong.net)
Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

To. Noh Sang Park (e-mail: nspark@shinbiro.com)
Jangmi Kolon Apt. 117-605, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Re. Declaration and Power of Attorney and Assignment to be filed with U.S. Patent and Trademark Office (U.S. Serial No. 10/560,664)
K&C Ref.: GP048360

Dear Sirs,

Hello. This is an announcement from Kim & Chang Law Offices.

Enclosed herewith please find scanned copies of our letter dated March 8, 2006 sent to you via content-certified mail. Please review the attached documents. When you receive the original documents, please sign and date the marked portions, and return them to us.

Thank you for your cooperation in this matter.

Law Offices of Kim & Chang
Attorney Jee Hong YOON (Tel. 82-2-2122-3515)
Manager Hee Jae IM (Tel. 82-2-2122-3822)

For more information regarding the documents, please contact Jiwon Lim (Tel. 82-2-2122-3838)

Ji-Won Lim
zjwlim@ip.kimchang.com

[Translation]

KIM & CHANG
Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea
Tel.: (822) 764-8855 / (822) 2122-3900 (Operator)
Fax.: (822) 741-0328 / (822) 745-5954 / (822) 763-7434

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zjwlim (Ji-Won Lim)

보낸 사람: zjwlim (Ji-Won Lim)
보낸 날짜: 2006년 3월 9일 목요일 오후 2:53
받는 사람: 'juneman@saekdong.net'; 'nspark@shinbiro.com'
참조: jhyoon (Jee-Hong Yoon); zhjim1(Hee-Jae Im)
제목: [김준만,박노상님] 김.장법률사무소입니다.
첨부 파일: FE241483-김준만,박노상-안내문.pdf; FE241483-김준만,박노상-서명서류.pdf; FE241483-김준만,박노상-발명신고.pdf

수 신 : 김 준 만 님
경기도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)
E-mail: juneman@saekdong.net
박 노 상 님
경기도 성남시 분당구 야탑동 장미코오롱아파트 120동 201호 (우.463-788)
E-mail: nspark@shinbiro.com
제 목 : 미국 특허청 제출용 서명서류 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : GP048360

안녕하세요. 김장법률사무소 입니다.

2006년 3월 8일자로 우편발송(내용증명)한 서신의 사본을 스캔하여 첨부합니다. 본건과 관련한 상세한 사항은 첨부한 서신을 참조하시고, 우편으로 발송된 서신 원본을 받으시면 해당 서류에 서명하신 후 당소에 반송해주시면 감사하겠습니다

귀하의 협조에 깊은 감사드립니다.
김.장특허법률사무소
변리사 윤 지 홍 (전화 02-2122-3515)
차장 임 희 재 (전화 02-2122-3822)

첨부있음.
(서명서류 관련 담당자: 과장 임 지 원 전화 02-2122-3838)

임지원(Ji-Won Lim)
zjwlim@ip.kimchang.com
직통 : (02) 2122 3838

金·張 法律事務所
서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764-8855 / (02) 2122-3900 (대표)
팩스: (02) 741-0328 / (02) 745-5954 / (02) 763-7434

위 전자우편에 포함된 정보는 위에 기재된 수신인만을 위해 발송되는 것으로서 보안을 유지해야 하는 정보 및 법률상 또는 다른 사유로 인하여 공개가 금지된 정보가 들어 있을 수 있습니다. 귀하가 이 전자우편의 지정 수신인이 아니면 이를 무단으로 보유, 전송, 배포할 수 없으며, 일부의 내용이라도 공개, 복사해서는 안됩니다. 그러므로, 잘못 수신된 경우에는 즉시 전화 또는 전자우편 주소(all@ip.kimchang.com)로 연락하여 주시고, 원본 및 사본과 그에 따른 첨부 문서를 모두 삭제하여 주시기 바랍니다.

EXHIBIT 2

[Translation]

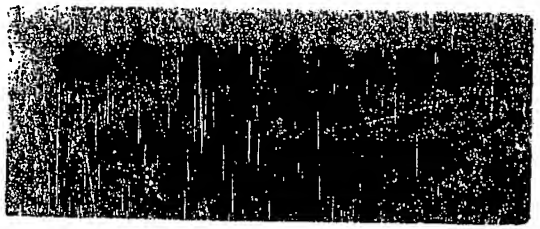
From Kim & Chang
To Mr. Noh Sang Park
Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

[Mail Return Notice by Post Office]
☑ delivery date: 2006-3-9

[Reason for Return]
☐ Recipient not present ☐ Recipient has moved ☐ Recipient refused to accept package ☐ Incorrect address
☑ **Recipient does not reside at indicated address**

US 10/560,664
DOC.3-1(TRANSLATION)

US 10/560,664
DOC. 3-1



경기도 성남시 분당구 야탑동
장미코오롱 아파트 120동 201호
박 노 상 님 귀하
463-788

EXHIBIT 3

[Translation]

[E-mail from inventor Noh Sang Park to K&C staff, Jiwon Lim]

From: parknohsang@gmail.com
Date: Mar 19, 2006 7:44 pm
To: zjwlim (Ji-Won Lim)
Subject: Re: [To. Mr. June Man Kim and Mr. Noh Sang Park] An announcement from Law offices of Kim & Chang

---

Hello. I am the inventor, Noh Sang Park.

Please be informed that my address has been changed as follows:

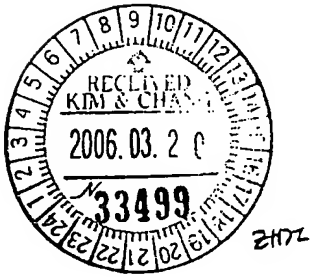
Jangmi Kolon Apt. 117-605, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Kindly explain how to proceed with this matter. Thank you.

Regards,
Noh Sang Park

Kim&Chang_IP

보낸 사람: "박노상 (NohSang Park)" [nspark@shinbiro.com]
보낸 날짜: 2006년 3월 19일 일요일 오후 7:44
받는 사람: zjwlim (Ji Won Lim)
참조: parknohsang@gmail.com
제목: Re: [김초미,박노상님] 김.장법률사무소입니다.



안녕하십니까?
박노상입니다.

아래의 주소가 변경되었습니다.
경기도 성남시 분당구 아탑동 장미코오롱아파트 117동 605호 (우.463-788)로 변경되었습니다.

어떻게 하면 되는지 알려 주십시오.
감사합니다.

박노상 드림.

zjwlim (Ji-Won Lim) 쓴 글:

> 수 신 : 김 초 미 님
> 경기 도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)
> E mail: juneman@saekdong.net
> 박 노 상 님
> 경기도 성남시 분당구 아탑동 장미코오롱아파트 120동 201호 (우.463-788)
> E-mail: nspark@shinbiro.com
> 제 목 : 미국 특허청 제출용 서명서류 송부의 건 (U.S. Serial No. 10/560,664)
> 당소 정리 번호 : GP048360
>
> 안녕하세 요. 김장법률사무소 입니다.
>
> 2006년 3월 8일 자로 우편발송(내용증명)한 서신의 사본을 스캔하여 첨부합니다. 본건과 관련한 상세한 사항은 첨부한 서신을 참 조하시고, 우편으로 발송된 서신 원본을 받으시면 해당 서류에 서명하신 후 당소에 반송해주시면 감사하겠습니다
>
> 귀하의 업무에 깊은 감사드립니다.
> 김.장특허법률사무소
> 변리사 문 지 홍 (전화 02-2122-3515)
> 사정 위 희 새 (전화 02-2122-3822)
>
> 첨부있음.
> (서명서류 관련 박노상님: 파싱 임 지 원 전화 02 2122 3838)

임지원(Ji-Won Lim)
zjwlim@ip.kimchang.com
직통 : (02) 2122 3838

金·張 法律事務所
서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764 8855 / (02) 2122 3900 (대표)
팩스: (02) 741 0328 / (02) 745-5954 / (02) 763-7434

위 전자우편에 포함된 정보는 위에 기재된 수신인만을 위해 발송되는 것으로서 보안을 유지해야 하는 정보 및 법률상 또는 다른 사유로 인하여 공개가 금지된 정보가 들어 있을 수 있습니다. 귀하가 이 전자우편의 지정 수신인이 아니면 이를 무단으로 보유, 전송, 배포할 수 없으며, 일부의 내용이라도 공개, 복사해서는 안됩니다. 그러므로, 실못 수신된 경우에는 즉시 전화 또는 전자우편 주소(allen@ip.kimchang.com)로 연락하여 주시고, 원본 및 사본과 그에 따른 첨부 문서를 모두 삭제하여 주시기 바랍니다.

--
박노상 (NohSang Park)
Mobile Phone: 017-342-3248
Email: nspark@shinbiro.com, parknohsang@gmail.com, parknohsang@paran.com

EXHIBIT 4

[Translation]

[E-mail to the inventor Noh Sang Park from K&C staff, Jiwon Lim]

From: zjwlim (Ji-Won Lim)
Date: Mar 20, 2006 9:43 AM
To: nspark@shinbiro.com
Cc: parknohsang@gmail.com; parknohsang@paran.com; zhjim1(Hee-Jae Im)
Subject: RE: [To. Mr. June Man Kim and Mr. Noh Sang Park] An announcement from Law offices of Kim & Chang
Attachment(s): FE241483- JMPNSP –SIGNATURE DOCUMENTS.pdf

Dear Mr. Park,

Thank you for your e-mail. As you requested, I attach hereto a new set of signature documents with your corrected address. Please print out the documents and sign on pages 3 and 6. To return the signed document, you may use a courier or a registered mail, whichever is convenient for you.

As you are aware, the inventors of the subject application are you and Mr. June Man Kim. However, we have not yet received any response from Mr. Kim. We would appreciate it if you could let us know his contact number so that we will be able to communicate with him. We hope this does not cause you any inconvenience.

If you have any other questions, please do not hesitate to contact me.

Law Offices of Kim & Chang
International Department
Assistant Manager Jiwon Lim (Tel. 82-2-2122-3838)

zjwlim (Ji-Won Lim)

보낸 사람: zjwlim (Ji-Won Lim)
보낸 날짜: 2006년 3월 20일 월요일 오전 9:43
받는 사람: 'nspark@shinbiro.com'
참조: 'parknohsang@gmail.com'; 'parknohsang@paran.com'; zhjim1(Hee-Jae Im)
제목: RE: [김준만,박노상님] 김.장법률사무소입니 다.
첨부 파일: FE241483-김준만,박노상-서명서류.pdf

박노상 선생님. 안녕하세요?

먼저 연락주셔서 감사합니다. 아래 보내주신대로 변경된 주소를 반영한 새로운 서류를 보내드리오니. 3페이지 성함 아래. 6페이지 성함 윗부분에 영문으로 서명하신후 원본을 착불택배 또는 우편으로 당소에 반송하여 주시기바랍니다.

본건의 경우는 김준만 선생님과 공동발명하신 사건으로서, 당소에서는 김선생님으로 부터 아직 아무런 연락을 받지 못하고 있습니다. 번거로우시겟지만 혹 연락처를 알고계시다면 당소에 알려주시면 업무에 많은 도움이 되겟습니다.

기타 다른 궁금하신 사항이 있으시면 언제든지 연락주십시요. 성심껏 답해드리겠습니다.

김.장법률사무소 국제부
과장 임 지 원 (전화 02-2122-3838)

첨부있음.

-----Original Message-----
From: "박노상 (NohSang Park)" [mailto:nspark@shinbiro.com]
Sent: Sunday, March 19, 2006 7:44 PM
To: zjwlim (Ji-Won Lim)
Cc: parknohsang@gmail.com
Subject: Re: [김준만,박노상님] 김.장법률사무소입니 다.

안녕하십니까?
박노상입니다.

아래의 주소가 변경되었습니다.
경기도 성남시 분당구 야탑동 장미코오롱아파트 117동 605호 (우.463-788)로 변경되었습니다.

어떻게 하면 되는지 알려 주십시오.
감사합니다.

박노상 드림.

zjwlim (Ji-Won Lim) 쓴 글:

수 신 : 김 준 만 님
경기 도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)
E-mail: juneman@saekdong.net
박 노 상 님
경기도 성남시 분당구 야탑동 장미코오롱아파트 120동 201호 (우.463-788)
E-mail: nspark@shinbiro.com
제 목 : 미국 특허청 제출용 서명서류 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : GP048360

안녕하세 요. 김장법률사무소 입니다.

2006년 3월 8일 자로 우편발송(내용증명)한 서신의 사본을 스캔하여 첨부합니다. 본건과 관련한 상세한 사항은 첨부한 서신을 참 조하시고, 우편으로 발송된 서신 원본을 받으시면 해당 서류에 서명하신 후 당소에 반송해주시면 감사하겠습니다

귀하의 협조에 깊은 감사드립니다.
김.장특허법률사무소
변리사 윤 지 홍 (전화 02-2122-3515)
차장 임 희 재 (전화 02-2122-3822)

첨부있음.
(서명서류 관련 당당자: 과장 임 지 원 전화 02-2122-3838)

임지원(Ji-Won Lim)
zjwlim@ip.kimchang.com
직통 : (02) 2122 3838

金·張 法律事務所
서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764-8855 / (02) 2122-3900 (대표)
팩스: (02) 741-0328 / (02) 745-5954 / (02) 763-7434

위 전자우편에 포함된 정보는 위에 기재된 수신인만을 위해 발송되는 것으로서 보안을 유지해야 하는 정보 및 법률상 또는 다른 사유로 인하여 공개가 금지된 정보가 들어 있을 수 있습니다. 귀하가 이 전자우편의 지정 수신인이 아니면 이를 무단으로 보유, 전송, 배포할 수 없으며, 일부의 내용이라도 공개, 복사해서는 안됩니다. 그러므로, 잘못 수신된 경우에는 즉시 전화 또는 전자우편 주소(all@ip.kimchang.com)로 연락하여 주시고, 원본 및 사본과 그에 따른 청부 문서를 모두 삭제하여 주시기 바랍니다.

--
박노상 (NohSang Park)
Mobile Phone: 017-342-3248
Email: nspark@shinbiro.com, parknohsang@gmail.com, parknohsang@paran.com

Case No.: 05-597-B

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

the specification of which is attached hereto unless the following space is checked:

☒ was filed on December 13, 2005 as United States Application Serial Number 10/560,664.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 (including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s):

	Number	Country	Day/Month/Year Filed
1.	PCT/KR2004/001851	PCT	23 July 2004
2.	10-2003-0050916	Korea	24 July 2003

I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and I direct that all correspondence be addressed to that Customer Number.

Customer Number: 020306
Principal attorney or agent: Robert J. Irvine, III
Telephone number: 312-913-0001

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

Full name of first inventor: June Man KIM

Inventor's signature: _____ Date: _____

Residence: Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

Citizenship: Republic of Korea

Post Office Address: Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

Full name of second inventor: Noh Sang PARK

Inventor's signature: _____ Date: _____

Residence: Jangmi Kolon Apt. 117-605 , Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Citizenship: Republic of Korea

Post Office Address: Jangmi Kolon Apt. 117-605 , Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

ASSIGNMENT

Case No.: 05-597-B Serial No.: 10/560,664
Inventors: June Man KIM, Noh Sang PARK
Date of Execution
of Application: Filing Date: December 13, 2005

In consideration of One Dollar ($1.00) and other good and valuable considerations in hand paid, the receipt and sufficiency whereof are hereby acknowledged, the undersigned hereby assign to:

UTSTARCOM KOREA LIMITED

its successors and assigns, the entire right, title and interest in the invention or improvements of the undersigned disclosed in an application for Letters Patent of the United States, entitled:

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

and identified as:

Case No. 05-597-B

in the offices of McDONNELL BOEHNEN HULBERT & BERGHOFF LLP and in said application and any and all other applications, both United States and foreign, which the undersigned may file, either solely or jointly with others, on said invention or improvements, and in any and all Letters Patent of the United States and foreign countries, which may be obtained on any of said applications, and in any reissue or extension of such patents, and further assigns to said assignee the priority right provided by the International Convention.

The undersigned hereby authorize and request the Commissioner of Patents and Trademarks to issue said Letters Patent to said assignee.

The undersigned hereby authorize and request the attorneys of record in said application to insert in this assignment the filing date and serial number of said application when officially known, and the date of execution of the application.

The undersigned warrant themselves to be the owners of the entire right, title and interest in said invention or improvements and to have the right to make this assignment, and further warrant that there are no outstanding prior assignments, licenses, or other encumbrances on the interest herein assigned.

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO ILLINOIS 60606
TELEPHONE (312) 913-0001

For said considerations the undersigned hereby agree, upon the request and at the expense of said assignee, its successors and assigns, to execute any and all divisional, continuation and substitute applications for said invention or improvements, and any necessary oath, affidavit or declaration relating thereto, and any application for the reissue or extension of any Letters Patent that may be granted upon said application and any and all applications and other documents for Letters Patent in foreign countries on said invention or improvements, that said assignee, its successors or assigns may deem necessary or expedient, and for the said considerations the undersigned authorize said assignee to apply for patents for said invention or improvements in its own name in such countries where such procedure is proper and further agree, upon the request of said assignee, its successors and assigns, to cooperate to the best of the ability of the undersigned with said assignee, its successors and assigns, in any proceedings or transactions involving such applications or patents, including the preparation and execution of preliminary statements, giving and producing evidence, and performing any and all other acts necessary to obtain, maintain and enforce said Letters Patent, both United States and foreign, and vest all rights therein hereby conveyed in the assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by the said assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made.

WITNESS my hand and seal this _____ day of _____, 2006.

_____
June Man KIM

State of

County of

The foregoing instrument was acknowledged before me this _____ day of

_____, _____ by _____.

_____
NOTARY PUBLIC

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

WITNESS my hand and seal this ___ day of _____, 2006.

_____
Noh Sang PARK

State of

County of

The foregoing instrument was acknowledged before me this _____ day of

_____, _____by _____.

_____
NOTARY PUBLIC

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP
300 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
TELEPHONE (312) 913-0001

EXHIBIT 5

[Translation]

[E-mail to the inventors June Man Kim and Noh Sang Park from K&C staff, Jiwon Lim]

From: zjwlim (Ji-Won Lim)
Date: May 13, 2006 4:27 PM
To: nspark@shinbiro.com
Cc: parknohsang@gmail.com; parknohsang@paran.com; zhjim1(Hee-Jae Im)
Subject: RE: [To. Mr. June Man Kim and Mr. Noh Sang Park] An announcement from Law offices of Kim & Chang
Attachment(s): FE241483- JMPNSP –SIGNATURE DOCUMENTS.pdf

Dear Messrs Kim and Park,

This is a reminder with regard to the subject case.

As I explained several times before, the right to receive a patent was transferred to UTStarcom Korea Limited. With respect to this invention, a Korean patent application was filed and its counterpart foreign applications were filed by UTStarcom. Unlike other countries such as Europe, China, and Japan, the U.S. Patent law requires documents signed by the inventors. Therefore, if the inventor is uncooperative, the assignee cannot submit the required documents. However, the assignee can substitute the required documents with due diligence documents evidencing the inventor's noncooperation.

Signing of the documents we presented to you results in no loss or no gain to you. It is our understanding that you had assigned your right to your former employer company by signing on the Inventor's Declaration and Assignment. Thus, you are expected to duly cooperate with the right owner or its successor.

For your information, recently we were instructed to pay (currently USD 250) as courtesy disbursement for the inventors assistances in providing signatures.

Please consider the foregoing and let us know via return e-mail whether you wish to cooperate in this matter or not. If you decide to cooperate, please return the signed documents together with the below form. If not, we will incorporate your decision in a due diligence document, which will be filed with the U.S. Patent and Trademark Office.

If you have any other questions, please do not hesitate to contact me.

Law Offices of Kim & Chang
International Department
Assistant Manager Jiwon Lim (Tel. 82-2-2122-3838)

[Translation]

ps. Please also provide us with your bank information and signature in the below form.

사 례 금 (Courtesy Disbursement)	
이름 (Name)	김 준 만 (June Man KIM)
미국 특허 출원 번호 (U.S. Serial No.)	10/560,664
사무소 관리 번호 (K&C Ref. MBHB Ref.)	FE241483/ 05-597-B
본인명의은행정보 (Bank Info.) 거래은행 (Bank Name) 계좌번호 (Account No.)	
등기우편수령가능주소 (Address for Correspondence)	
전화번호 (Telephone No.)	
금액 (Amount)	USD250
자필서명 (Acceptance Signature)	
서명일자 (Date)	

사 례 금 (Courtesy Disbursement)	
이름 (Name)	박 노 상 (Noh Sang PARK)
미국 특허 출원 번호 (U.S. Serial No.)	10/560,664
사무소 관리 번호 (K&C Ref. MBHB Ref.)	FE241483/ 05-597-B
본인명의은행정보 (Bank Info.) 거래은행 (Bank Name) 계좌번호 (Account No.)	

[Translation]

등기우편수령가능주소 (Address for Correspondence)	
전화번호 (Telephone No.)	
금액 (Amount)	USD250
자필서명 (Acceptance Signature)	
서명일자 (Date)	

zjwlim (Ji-Won Lim)

보낸 사람: zjwlim (Ji-Won Lim)
보낸 날짜: 2006년 5월 13일 토요일 오후 4:27
받는 사람: 'nspark@shinbiro.com'
참조: 'parknohsang@gmail.com'; 'parknohsang@paran.com'; zhjim1(Hee-Jae Im)
제목: RE: [김준만,박노상님] 김.장법률사무소입니 다.(GP048360)
첨부 파일: FE241483-김준만,박노상-서명서류.pdf

김준만, 박노상 선생님.

본건과 관련하여 다시 한번 연락드립니다.

이전에도 여러번 설명드렸다시피, 귀하의 발명에 대해 특허를 받을 수 있는 권리는 유티스타콤에 있습니다. 유티스타콤은 귀하의 발명에 대해 해외 출원을 진행 중에 있습니다만, 유럽, 중국, 일본 등과는 달리 미국은 발명자의 서명 서류를 필요로 하고 있습니다. 이러한 서류의 제출은 발명자가 협조하지 않으면 불가능하게 되겠지만 이 경우에는 발명자가 협조하지 않는다는 것을 증명할 수 있는 관련 서류로 갈음함으로써 꼭 제출하지 않아도 무방합니다.

서명을 하고 안하고의 득실관계에 있어 특별한 사항은 없습니다. 다만 귀하께서는 이전소속 직장에서 소정의 보상을 받고 직무발명 양도서에 서명함으로써 특허를 받을 권리를 타인에게 넘겼기 때문에 특허를 받을 권리의 최종 승계자가 특허를 받을 수 있도록 신의 성실로 협조하여야할 의무가 있다고 추정할 수 있습니다. 또한가지는 서명을 하겠다는 취지와 함께 서명과 관련된 시간 소비등에 대한 보상을 요구하는 경우 유티스타컴 미국 본사에서 소정액($250;변화가 있을 수 있음)을 지급한다는 결정이 있었습니다.

상기 설명을 참조하시고 서명 협조에 대한 귀하의 의견을 본 메일에 회신으로 통지해주시기 바랍니다. 서명을 해주실 경우 첨부한 서명서류의 지정된 위치에 서명하여 당 사무소 착불로 택배/퀵서비스편으로 서류 원본을 보내주시기 바랍니다. 서명을 안하겠다고 하시는 경우에는 미국 특허청에 이 사실을 증거자료와 함께 제출하도록 하겠습니다.

기타 궁금하신 사항은 아래 당당자에게 연락주시기 바랍니다.

김.장법률사무소 국제부
과장 임지원 (전화 02-2122-3838)

ps. 사인한 원본서류 발송시, 아래 양식도 채워서 함께 보내주시기 바랍니다.

사 례 금 (Courtesy Disbursement)	
이름 (Name)	김 준 만 (June Man KIM)
미국 특허 출원 번호 (U.S. Serial No.)	10/560,664
사무소 관리 번호 (K&C Ref. MBHB Ref.)	FE241483/ 05-597-B
본인명의은행정보 (Bank Info.) 거래은행 (Bank Name) 계좌번호 (Account No.)	
등기우편수령가능주소 (Address for Correspondence)	
전화번호 (Telephone No.)	
금액 (Amount)	US$250
서명수령 (Acceptance Signature)	
서명일자 (Date)	

사 례 금 (Courtesy Disbursement)	
이름 (Name)	박 노 상 (Noh Sang PARK)
미국 특허 출원 번호 (U.S. Serial No.)	10/560,664
사무소 관리 번호 (K&C Ref. MBHB Ref.)	FE241483/ 05-597-B
본인명의은행정보 (Bank Info.) 거래은행 (Bank Name) 계좌번호 (Account No.)	
등기우편수령가능주소 (Address for Correspondence)	
전화번호 (Telephone No.)	
금액 (Amount)	US$250
수락서명 (Acceptance Signature)	
서명일자 (Date)	

From: zjwlim (Ji-Won Lim)
Sent: Monday, March 20, 2006 9:43 AM
To: 'nspark@shinbiro.com'
Cc: 'parknohsang@gmail.com'; 'parknohsang@paran.com'; zhjim1(Hee-Jae Im)
Subject: RE: [김준만,박노상님] 김.장법률사무소입니 다.

박노상 선생님, 안녕하세요?

먼저 연락주셔서 감사합니다. 아래 보내주신대로 변경된 주소를 반영한 새로운 서류를 보내드리오니, 3페이지 성함 아래, 6페이지 성함 윗부분에 영문으로 서명하신후 원본을 착불택배 또는 우편으로 당소에 반송하여 주시기바랍니다.

본건의 경우는 김준만 선생님과 공동발명하신 사건으로서, 당소에서는 김선생님으로 부터 아직 아무런 연락을 받지 못하고 있습니다. 번거로우시겟지만 혹 연락처를 알고계시다면 당소에 알려주시면 업무에 많은 도움이 되겟습니다.

기타 다른 궁금하신 사항이 있으시면 언제든지 연락주십시요. 성심껏 답해드리겠습니다.

김.장법률사무소 국제부
과장 임 지 원 (전화 02-2122-3838)

첨부있음.

-----Original Message-----
From: "박노상 (NohSang Park)" [mailto:nspark@shinbiro.com]
Sent: Sunday, March 19, 2006 7:44 PM
To: zjwlim (Ji-Won Lim)
Cc: parknohsang@gmail.com
Subject: Re: [김준만,박노상님] 김.장법률사무소입니 다.

안녕하십니까?
박노상입니다.

아래의 주소가 변경되었습니다.
경기도 성남시 분당구 야탑동 장미코오롱아파트 117동 605호 (우.463-788)로 변경되었습니다.

어떻게 하면 되는지 알려 주십시오.
감사합니다.

박노상 드림.

zjwlim (Ji-Won Lim) 쓴 글:

수 신 : 김 준 만 님
경기 도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)
E-mail: juneman@saekdong.net
박 노 상 님
경기도 성남시 분당구 야탑동 장미코오롱아파트 120동 201호 (우.463-788)
E-mail: nspark@shinbiro.com
제 목 : 미국 특허청 제출용 서명서류 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : GP048360

안녕하세 요. 김장법률사무소 입니다.

2006년 3월 8일 자로 우편발송(내용증명)한 서신의 사본을 스캔하여 첨부합니다. 본건과 관련한 상세한 사항은 첨부한 서신을 참 조하시고, 우편으로 발송된 서신 원본을 받으시면 해당 서류에 서명하신 후 당소에 반송해주시면 감사하겠습니다

귀하의 협조에 깊은 감사드립니다.
김.장특허법률사무소
변리사 윤 지 홍 (전화 02-2122-3515)
차장 임 희 재 (전화 02-2122-3822)

첨부있음.
(서명서류 관련 담당자: 과장 임 지 원 전화 02-2122-3838)

임지원(Ji-Won Lim)
zjwlim@ip.kimchang.com
직통 : (02) 2122 3838

金·張 法律事務所
서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764-8855 / (02) 2122-3900 (대표)
팩스: (02) 741-0328 / (02) 745-5954 / (02) 763-7434

위 전자우편에 포함된 정보는 위에 기재된 수신인만을 위해 발송되는 것으로서 보안을 유지해야 하는 정보 및 법률상 또는 다른 사유로 인하여 공개가 금지된 정보가 들어 있을 수 있습니다. 귀하가 이 전자우편의 지정 수신인이 아니면 이를 무단으로 보유, 전송, 배포할 수 없으며, 일부의 내용이라도 공개, 복사해서는 안됩니다. 그러므로, 잘못 수신된 경우에는 즉시 전화 또는 전자우편 주소(all@ip.kimchang.com)로 연락하여 주시고, 원본 및 사본과 그에 따른 첨부 문서를 모두 삭제하여 주시기 바랍니다.

—
박노상 (NohSang Park)
Mobile Phone: 017-342-3248
Email: nspark@shinbiro.com, parknohsang@gmail.com, parknohsang@paran.com

EXHIBIT 6

[Translation]

Telephone Log

Ext.	Start time	Duration	Phone No.	Type	Charge
3838	2006-06-20 14:21:56	00:02:37	0173423248	mobile phone	261(KRW)

US 10/560,664
DOC. 7-1(TRANSLATION)

num_ip.txt

3838	20-14:21:56	20-14:24:33	PCS:KT	00:02:37	261	휴대폰	0173423248	50C6	2006

[Translation]

KIM & CHANG

Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea
Telephone: (822) 764-8855 / 2122-3900 Fax: (822) 741-0328 / 745-5954 / 763-7434
E-Mail: all@ip.kimchang.com

June 28, 2006

To. June Man Kim
Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708, Republic of Korea

To. Noh Sang Park
Jangmi Kolon Apt. 117-605, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788, Republic of Korea

Re. Declaration and Power of Attorney and Assignment to be filed with U.S. Patent and Trademark Office (U.S. Serial No. 10/560,664)
K&C Ref.: GP048360
(Title of the Invention: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM)

<MEMORANDUM>

Through our letter of March 8, 2006, you are aware that the above-identified invention, which you developed in 2003 and assigned your right to receive patent to Hyundai Syscomm, Inc. according to the employee's invention compensation policy, and currently the right to receive patent for this invention is transferred to our client UTStarcom Korea Limited.

According to a telephone contact made between the 2nd named inventor, Mr. Noh Sang Park and Jiwon Lim of Kim & Chang on June 20, 2006 at 14:21:56 ~ 14:24:33, Mr. June Man Kim confirmed that the inventors will not cooperate in this U.S. patent application.

We will convey the inventors' confirmation to the U.S. associate so that inventors' noncooperation will be filed with the U.S. Patent and Trademark Office.

-Contact Person: Attorney Ju Young KIM/
Attorney Jee Hong YOON
-Telephone: 02-2122-3561 / 02-2122-3515
-E-maill: jykim1@ip.kimchang.com
Attorney Jee Hong YOON (seal)

金 · 張 法律事務所

서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
Website: www.ip.kimchang.com E-Mail: all@ip.kimchang.com
전화: (02) 764-8855 / 2122-3900 Fax: (02) 745-5954 / 741-0328 / 763-7434

2006년 6월 28일

수 신 : 김 준 만 님
경기도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)
박 노 상 님
경기도 성남시 분당구 야탑동 장미코오롱아파트 117동 605호 (우.463-788)

제 목 : 미국 특허청 제출 서명서류 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : FE241483 (MBHB 05-597-B)
(발명의 명칭: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM)

<MEMORANDUM>

2006년 3월 8일자 당소 서신 및 이메일을 통하여, 귀하께서는 2003년도에 현대전자산업 주식회사/현대시스콤 재직 중에 개발하신 상기 발명에 대한 권리가 당시 소속회사의 직무발명 양도규정에 따라 소속회사에 양도되었으며, 현재 이 발명에 대해 특허를 받을 수 있는 권리가 당시 소속회사로부터 당소의 의뢰인인 유티스타콤 코리아 유한회사로 이전되어 있는 상태를 인지하고 계십니다.

본 발명의 제2발명자이신 박노상 님과 김.장법률사무소 국제부 과장 임지원과의 전화통화 (2006년 6월 20일 14시21분56초 ~ 14시24분33초)를 통하여 제1발명자이신 김준만 님을 포함하여 발명자 전원은 상기 발명의 미국 출원 진행에 협조하지 않을 것임을 확인하셨습니다.

당소에서는 위와 같은 발명자분들의 의사를 미국 대리인을 통하여 특허청에 제출하도록 하겠습니다.

-담당자: 김 주 영 변리사 / 윤 지 홍 변리사
-전화: 02-2122-3561 / 02-2122-3515
-E-mail: jykim1@ip.kimchang.com
변리사 윤 지 홍

EXHIBIT 7

zjwlim (Ji-Won Lim)

보낸 사람: zjwlim (Ji-Won Lim)
보낸 날짜: 2007년 2월 7일 수요일 오후 6:29
받는 사람: 'juneman@saekdong.net'
참조: jykim1 (Joo-Young Kim)
제목: [김준만님]김.장법률사무소입니다.
첨부 파일: 05-597-B-Specification.pdf

Re: 미국특허출원번호 제 10/560,664 (당소정리번호 FE241483)

안녕하십니까 김장법률사무소입니다.

지난 2006년 6월 20일자 공동발명자이신 박노상님과의 전화통화를 통해 본건의 미국출원과 관련하여 도움을 주실수 없다는 입장을 밝히셨으며, 이에 따라 저희 사무소에서는 이러한 의사를 미국특허청에 전달하고 미국출원 절차를 진행하고 있습니다.

이 과정에서 저희 사무소에서는 선생님께 발명신고서를 첨부하여 검토를 부탁드렸으나, 미국특허청에서는 미국특허청에 제출된 미국출원 명세서도 함께 선생님께 보내드려야 한다는 의견입니다.

다소 번거로우시겠지만, 첨부된 미국출원 명세서를 검토하신후 이에 대한 협조여부를 회신으로 알려주시면 감사하겠습니다.

김.장법률사무소
변리사 김주영 (전화 02-2122-3561)
과장 임지원 (전화 02-2122-3838)

Ji-Won Lim
zjwlim@ip.kimchang.com
직통 : (02) 2122 3838

金·張 法律事務所
서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764-8855 / (02) 2122-3900 (대표)
팩스: (02) 741-0328 / (02) 745-5954 / (02) 763-7434

위 전자우편에 포함된 정보는 위에 기재된 수신인만을 위해 발송되는 것으로서 보안을 유지해야 하는 정보 및 법률상 또는 다른 사유로 인하여 공개가 금지된 정보가 들어 있을 수 있습니다. 귀하가 이 전자우편의 지정 수신인이 아니면 이를 무단으로 보유, 전송, 배포할 수 없으며, 일부의 내용이라도 공개, 복사해서는 안됩니다. 그러므로, 잘못 수신된 경우에는 즉시 전화 또는 전자우편 주소(all@ip.kimchang.com)로 연락하여 주시고, 원본 및 사본과 그에 따른 첨부 문서를 모두 삭제하여 주시기 바랍니다.

[Translation]

[E-mail to the inventor June Man Kim from K&C staff, Jiwon Lim]

From: zjwlim (Ji-Won Lim)
Date: February 7, 2007 6:29 PM
To: juneman@saekdong.net
Cc: jykim1 (Joo-Young Kim)
Subject: [To. Mr. June Man Kim] An announcement from Law offices of Kim & Chang
Attachment(s): 05-597-B-Specificatin.pdf

Re: U.S. Patent Application No. 10/560,664 (Our Ref. FE24148)

Below is an announcement from the law offices of Kim & Chang:

With respect to the above-identified application, we had been informed by the other joint inventor, Mr. Noh Sang Park, that your position was not to cooperate with us. Thus, we conveyed your position to the U.S. Patent and Trademark Office in due course.

In this regard, we had provided you with the Inventor's Declaration, as submitted to Hyundai Syscomm, for your review. Furthermore, we also provide you with the specification and drawings as filed with the U. S. Patent and Trademark Office for your review.

We understand your views may be complex, however, we would appreciate it if you could notify us of your decision after reviewing the U.S. specification and drawings via e-mail. If you have any questions or comments, please do not hesitate to contact us. We look forward to your response.

Law Offices of Kim & Chang
Patent Attorney Joo-Young Kim (Tel. 02-2122-3561)
Assistant Manager Jiwon Lim (Tel. 02-2122-3838)

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(71) Applicant (*for all designated States except US*): UTStarcom Korea Limited [KR/KR]; San 136-1, Ami-ri, Bubal-eub, Icheon-si, Kyongki-do 467-701 (KR).

(72) Inventors; and
(75) Inventors/Applicants (*for US only*): KIM, June Man [KR/KR]; Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708 (KR). PARK, Noh Sung [KR/KR]; Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788 (KR).

(74) Agent: YOON, Jee Hong; Hannuri Bldg., 219, Nacja-dong, Chongno-gu, Seoul 110-053 (KR).

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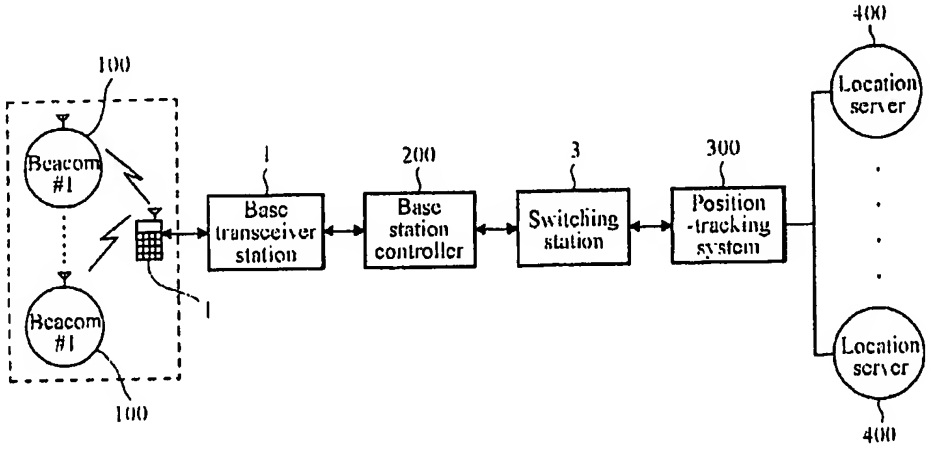
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM



(57) Abstract: The present invention relates to a device for tracking the position of a mobile unit in a mobile communication system by using beacons, wherein each beacon has its own sub-coverage in the cell coverage of a base transceiver station (BTS). The present invention resolves the problems of the conventional network-based or handset-based position tracking methods. By using beacon information included in a Pilot Strength Measurement Message (PSMM) signal, the present invention increases the accuracy of position tracking to thereby improve the quality of supplemental services in the mobile communication system.

WO 2005/011153 A1

Description

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

Technical Field

[1] The present invention generally relates to tracking position of a mobile unit in a mobile communication system, and more particularly to a system and a method for tracking position of a mobile unit by using a plurality of beacons. The beacons, each of which has a certain coverage, are installed within a cell coverage of a base station such that when a mobile unit comes into the coverage of a beacon, the current position of the mobile unit can be accurately determined by using information on the beacon.

Background Art

[2] One of the conventional methods for tracking position of a mobile unit is a network-based positioning approach which uses specialized location equipment within the network to determine the location of a mobile unit. The other conventional method is a handset-based positioning approach which uses specialized electronics, such as a global positioning system (GPS), within the mobile unit.

[3] The accuracy of positioning the mobile unit by the conventional methods, however, can be significantly compromised in metropolitan environments where local obstructions, such as large buildings, often disrupt signal reception. While moving through regions crowded with large buildings, the mobile unit oftentimes cannot receive signals from satellites for tracking position or pilot signals from neighboring base stations due to crowded environments. As shown in Fig. 1, the network-based positioning approach employs pilot signals from the neighboring base stations to track position of the mobile unit. The mobile unit must receive pilot signals from at least 3 neighboring base stations in order to accurately determine the position. In the metropolitan environment, however, it is practically impossible for the mobile unit to receive pilot signals from at least 3 neighboring base stations.

Disclosure of Invention

Technical Problem

[4] This resulted in the significant degradation in the accuracy of determining the position of the mobile unit, which in turn adversely affected the quality of the location-based supplemental service in a mobile communication. The conventional methods

simply could not satisfy the expectations of subscribers for the location-based service.

Technical Solution

[5] In order to address and resolve the problems of the conventional approaches, the present invention provides a system for tracking position of a mobile unit in a mobile communication system. The system comprises a plurality of beacons installed within a cell coverage of a base station, in which each beacon has its sub-coverage and transmits a pilot signal to the mobile unit in the sub-coverage. Further, a base station controller is provided for checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal upon receiving the PSMM signal from the mobile unit via a base transceiver station. The base station controller transmits position information including the beacon information if the beacon information is included in the PSMM signal. Such controller transmits neighbor list information on base transceiver stations adjacent to the mobile unit if the beacon information is not included in the PSMM signal. The system additionally comprises a position-tracking device for extracting information on the corresponding beacon from its database by using the position information upon receiving the position information including the beacon information from the base station controller. It then tracks/determines the position of the mobile unit by using the information on the corresponding beacon. Alternatively, the position-tracking device tracks/determines the position of the mobile unit by a conventional position-tracking method by using the neighbor list information on the adjacent base transceiver stations upon receiving the neighbor list information on the base transceiver stations adjacent to the mobile unit from the base station controller.

[6] The present invention further provides a method for tracking the position of a mobile unit in a communication system including the mobile unit, beacons, base station controller and position-tracking device. The method comprises: checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal when the base station controller receives the PSMM signal from the mobile unit; transmitting position information including the beacon information from the base station controller to the position-tracking device if the PSMM signal from the mobile unit contains the beacon information; and extracting information on the corresponding beacon from the database of the position-tracking system when the position-tracking system receives the position information including the beacon information from the base station controller and tracking/determining the position of the mobile unit by using the information on the corresponding beacon.

Advantageous Effects

[7] The system and the method for tracking position by using beacons in accordance with the present invention can improve the reliability and the accuracy of determining the position of the mobile unit. Such system and method can further improve the quality of the location-based supplemental services.

Brief Description of the Drawings

[8] The above and other objects and features of the present invention will become apparent from the following description of the embodiments provided in conjunction with the accompanying drawings.

[9] Fig. 1 is a schematic diagram for illustrating the conventional network-based positioning approach.

[10] Fig. 2 is a schematic diagram of a system for tracking position by using beacons in accordance with the present invention.

[11] Figs. 3 to 6 illustrate configurations of beacons installed within a cell coverage of the base station shown in Fig 2.

[12] Fig. 7 is a flow chart showing a method for tracking position of a mobile unit by using beacons in accordance with an embodiment of the present invention.

Best Mode for Carrying Out the Invention

[13] Referring to Fig. 2, the system for tracking position by using beacons in accordance with the present invention comprises a plurality of beacons 100, a base station controller 200 and a position-tracking device 300 (which is commonly referred to as a position determination entity (PDE)).

[14] A plurality of the beacons 100 is installed in a cell coverage of a base station 2. Each beacon 100 has its own sub-coverage and transmits a pilot signal to a mobile unit located in its sub-coverage. The beacons 100, each of which has the same radius of sub-coverage, may be installed to cover the whole area of the cell coverage of the base station 2 as shown in Fig. 3. The beacons 100, each of which has a different radius of sub-coverage, may be installed to cover particular regions of the cell coverage of the base station 2 (shown in Fig. 4). The beacons may be installed as shown in Fig. 5 so that at least three virtual pilot signals are provided at regions having only one-way pilot signal within the cell coverage of the base station 2 to improve the tracking accuracy. Alternatively, the beacons may be installed at borders with adjacent base stations as shown in Fig. 6 so that two-way pilot signal can be provided at regions having only one-way pilot signal to guarantee the accuracy of tracking within the cell

coverage. The configuration of the beacons 100 in the cell coverage of the base station 2 may be adjusted according to the local environments. The radius of the sub-coverage of the beacon 100 ranges from 5m to 300m, which can be adjusted by the power of the pilot signal.

[15] The base station controller 200 transmits a Pilot Strength Measurement Message (PSMM) request to the mobile unit 1. It then checks whether the PSMM signal received from the mobile unit 1 during a transmission period of the PSMM signal includes the beacon information. If the PSMM signal contains the beacon information, then the base station controller 200 transmits the position information containing the beacon information to the position-tracking device 300 via the switching station 3. The position information transmitted from the base station controller 200 to the position-tracking device 300 includes pilot number (PN) information of the corresponding beacon 100, delay information representing a distance from the center of the corresponding beacon to the mobile unit 1, and time stamp information representing measurement time of the mobile unit 1.

[16] When the PSMM signal received from the mobile unit 1 does not contain the beacon information, the base station controller 200 transmits the neighbor list information on base transceiver stations 2 adjacent to the mobile unit 1 to the position-tracking device 300 via the switching station 2.

[17] When the position-tracking device 300 receives the position information containing the beacon information from the base station controller 200, the position-tracking device 300 extracts information on the corresponding beacon 100 from its database using the position information. Then, it tracks/determines the position of the mobile unit 100 through using the extracted information on the corresponding beacon 100. The information extracted from the database of the position-tracking device 300 includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon. The position-tracking device further transmits the information on the position of the mobile unit 1 to location servers 400.

[18] When the position-tracking device 300 receives the neighbor list information on the base transceiver stations 2 adjacent to the mobile unit 100 from the base station controller 200, the position-tracking device 300 determines the position of the mobile unit 1 by using the neighbor list information according to the conventional position-tracking method. It then transmits the information on the position of the mobile unit 1 to the location servers 400.

[19] Referring now to Fig. 7, a method for tracking position of a mobile unit by using beacons is described in accordance with an embodiment of the present invention.

[20] At step 100, the base station controller 200 checks whether the PSMM signal received from the mobile unit 1 contains the beacon information.

[21] When the PSMM signal received from the mobile unit 1 contains the beacon information, the base station controller 200 transmits the position information including the beacon information to the position-tracking device 300 at step 200. The position information transmitted from the base station controller 200 to the position-tracking device 300 includes pilot number (PN) information of the corresponding beacon 100, delay information representing a distance from the center of the corresponding beacon to the mobile unit 1, and time stamp information representing measurement time of the mobile unit 1.

[22] At step 300, when the position-tracking device 300 receives the position information including the beacon information, the position-tracking device 300 extracts the information on the corresponding beacon from its database by using the position information. Then, the position-tracking device 300 determines the position of the mobile unit 1 through using the extracted information on the corresponding beacon 100. The information extracted from the database of the position-tracking device 300 includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon. The tolerance for the accuracy of positioning the mobile unit in accordance with the present invention is about 30 m, which is better than that of the conventional network-based approach or the handset-based positioning approach (e.g., 100 m).

[23] When the PSMM signal received from the mobile unit 1 does not contain the beacon information, the base station controller 200 transmits the neighbor list information on base transceiver stations adjacent to the mobile unit 1, which is necessary to track position according to the conventional approach, to the position-tracking device 300 at step 400.

[24] After receiving the neighbor list information from the base station controller 200, the position-tracking device 300 tracks/determines the position of the mobile unit 1 by using the neighbor list information. This is done by the conventional position-tracking method at step 500.

[25] The information on the location of the mobile unit, which was determined through steps 100 to 500, is transmitted to the location servers 400 and can be used in various location-based supplemental services of the mobile communication.

Industrial Applicability

[26] As described above, the system and the method for tracking position by using beacons in accordance with the present invention can enhance the reliability and the accuracy of tracking position. As such, the quality of the location-based supplemental services can be improved.

[27] Furthermore, in accordance with the present invention, at least two-way pilot signal is provided by beacons at regions within the cell coverage of a base station where signals from the adjacent base stations is not present, that is, where only one-way pilot signal is present. This improves the accuracy of tracking position.

[28] While the present invention has been shown and described herein with respect to the particular embodiments, those skilled in the art will recognize that many exchanges and modifications may be made without departing from the scope of the invention as defined in the appended claims.

Claims

[1] A system for tracking position of a mobile unit in a mobile communication system, comprising

a plurality of beacons installed within a cell coverage of a base station, each beacon having its sub-coverage and transmitting a pilot signal to the mobile unit in the sub-coverage;

a base station controller for checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal upon receiving the PSMM signal from the mobile unit via a base transceiver station, the base station controller transmitting position information including the beacon information if the beacon information is included in the PSMM signal, the base station controller transmitting neighbor list information on base transceiver stations adjacent to the mobile unit if the beacon information is not included in the PSMM signal; and

a position-tracking device for extracting information on the corresponding beacon from its database by using the position information upon receiving the position information including the beacon information from the base station controller, the position-tracking device further tracking/determining the position of the mobile unit by using the information on the corresponding beacon, or for tracking/determining position of the mobile unit by a conventional position-tracking method by using the neighbor list information on the adjacent base transceiver stations upon receiving the neighbor list information on the base transceiver stations adjacent to the mobile unit from the base station controller.

[2] The system of claim 1, wherein the radius of the sub-coverage of the beacon ranges from about 5 m to about 300 m.

[3] The system of claim 1, wherein the position information transmitted from the base station controller to the position-tracking device includes pilot number (PN) information of the corresponding beacon, delay information representing a distance from the center of the corresponding beacon to the mobile unit, and time stamp information representing measurement time of the mobile unit.

[4] The system of claim 1, wherein the information on the corresponding beacon which is extracted from the database of the position-tracking device includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon.

[5] The system of claim 1, wherein each beacon has the same radius of coverage and a plurality of the beacons are installed uniformly to cover the whole area of the cell coverage of a particular base station.

[6] The system of claim 1, wherein each beacon has different radius of coverage and a plurality of the beacons are installed at only particular regions within cell coverage of a particular base station to cover only the particular regions.

[7] The system of claim 1, wherein a plurality of the beacons are installed so that virtual PN is provided toward inside the border of the cell coverage of a particular base station at regions within the cell-coverage of the particular base station where only one pilot signal is sensed.

[8] The system of claim 1, wherein each beacon has the same radius of coverage and a plurality of the beacons are installed so that virtual PN is provided to a cell coverage of a particular base station and to a cell coverage of adjacent base stations at regions within the cell-coverage of the particular base station where only one pilot signal is sensed.

[9] A method for tracking position of a mobile unit in a communication system including the mobile unit, beacons, a base station controller and a position-tracking device, the method comprising:
checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal when the base station controller receives the PSMM signal from the mobile unit;
transmitting position information including the beacon information from the base station controller to the position-tracking device if the PSMM signal from the mobile unit contains the beacon information; and
extracting information on the corresponding beacon from the database of the position-tracking device when the position-tracking device receives the position information including the beacon information from the base station controller, and tracking/determining the position of the mobile unit using the information on the corresponding beacon.

[10] The method of claim 9, further comprising
transmitting neighbor list information on the base transceiver stations adjacent to the mobile unit to the position-tracking device if the PSMM signal received from the mobile unit does not contain the beacon information,
tracking/determining the position of the mobile unit by a conventional position-tracking method through using the neighbor list information when the position-

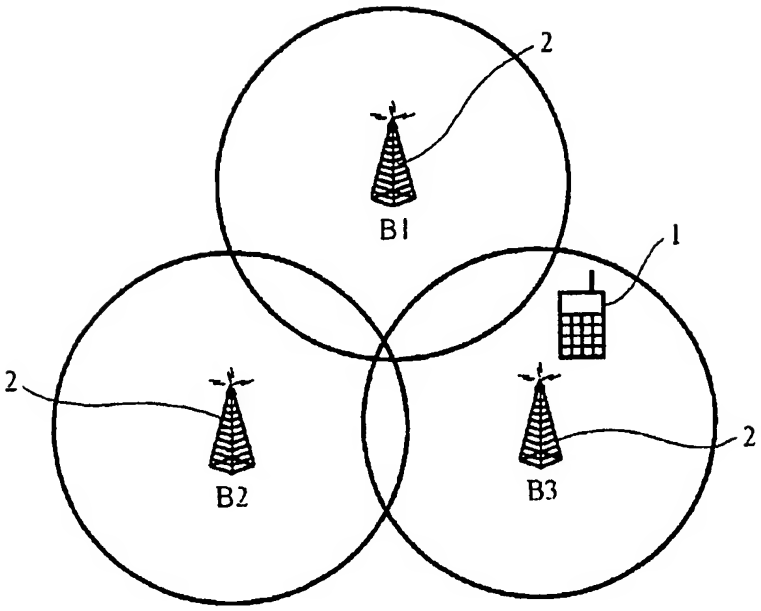
tracking device receives the neighbor list information from the base station controller.

[11] The method of claim 9, wherein the position information including the beacon information, which the base station controller transmits to the position-tracking system, includes pilot number (PN) information of the corresponding beacon, delay information representing a distance from the center of the corresponding beacon to the mobile unit, and time stamp information representing measurement time of the mobile unit.

[12] The method of claim 9, wherein the information on the corresponding beacon, which is extracted from the database of the position-tracking device includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon.

[13] The method of claim 9, wherein the tracked information on the position of the mobile unit is employed in the location-based supplemental service of the mobile communication system.

[Fig. 1]



[Fig. 2]

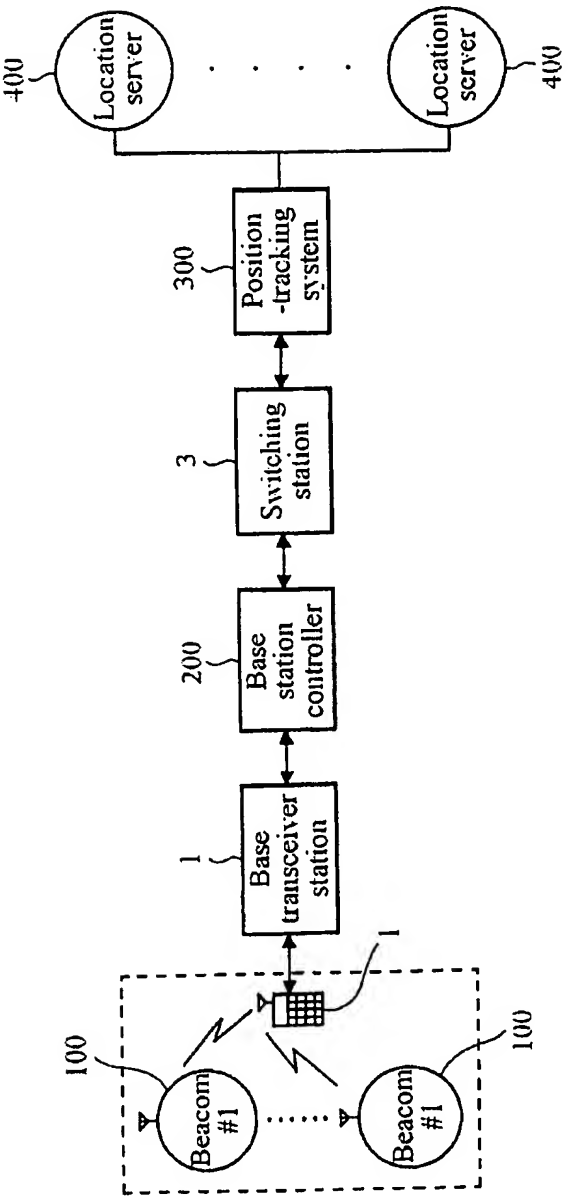
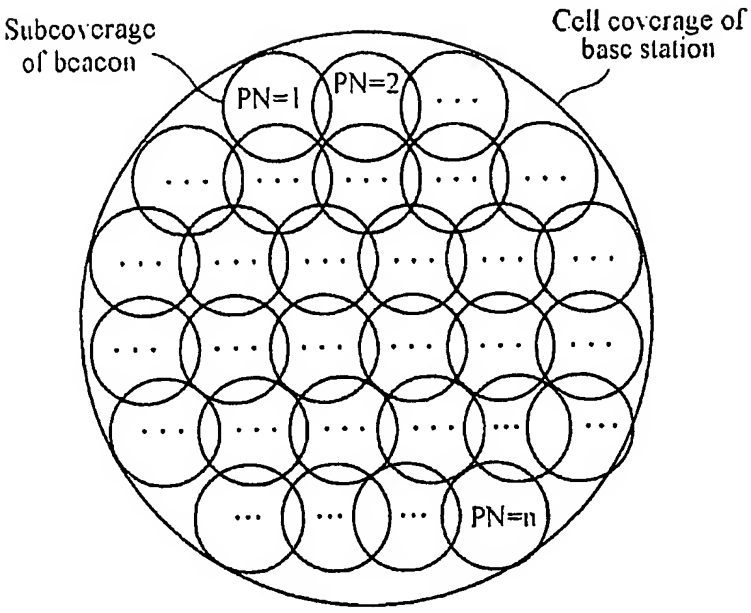
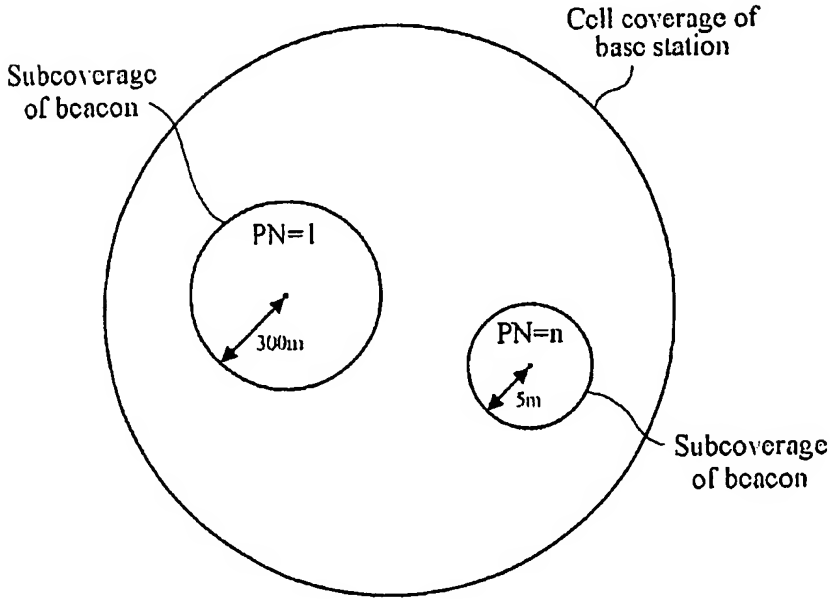

Location server
400
Location server
400
Position -tracking system
300
Switching station
3
Base station controller
200
Base transceiver station
1
Beacom #1
100
Beacom #1
100

Fig. 2

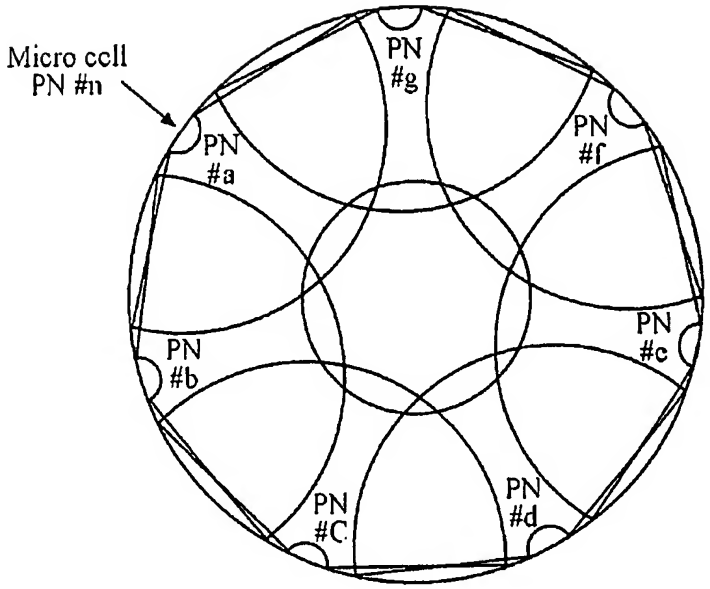
[Fig. 3]


Subcoverage of beacon
Cell coverage of base station
PN=1
PN=2
PN=n

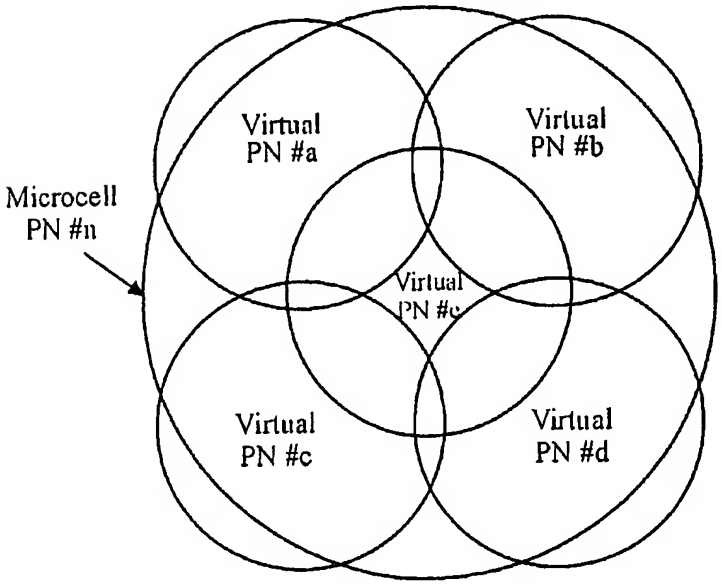
[Fig. 4]


Cell coverage of base station
Subcoverage of beacon
PN=1
300m
PN=n
5m
Subcoverage of beacon

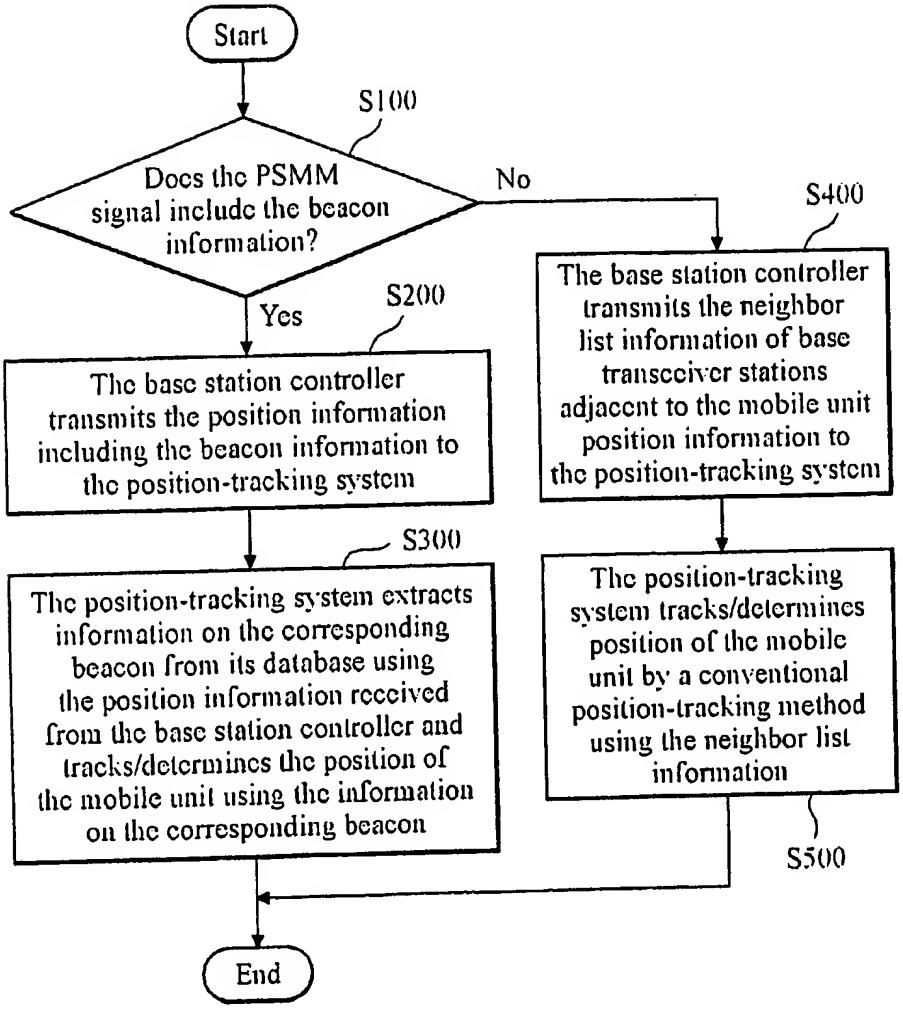
[Fig. 5]


Micro cell
PN #n
PN
#g
PN
#a
PN
#f
PN
#c
PN
#b
PN
#C
PN
#d

[Fig. 6]


Microcell
PN #n
Virtual
PN #a
Virtual
PN #b
Virtual
PN #c
Virtual
PN #d

[Fig. 7]


Start
S100
Does the PSMM signal include the beacon information?
No
S400
The base station controller transmits the neighbor list information of base transceiver stations adjacent to the mobile unit position information to the position-tracking system
Yes
S200
The base station controller transmits the position information including the beacon information to the position-tracking system
S300
The position-tracking system extracts information on the corresponding beacon from its database using the position information received from the base station controller and tracks/determines the position of the mobile unit using the information on the corresponding beacon
The position-tracking system tracks/determines position of the mobile unit by a conventional position-tracking method using the neighbor list information
S500
End

zjwlim (Ji-Won Lim)

보낸 사람: zjwlim (Ji-Won Lim)
보낸 날짜: 2007년 2월 7일 수요일 오후 6:32
받는 사람: 'nspark@shinbiro.com'; 'parknohsang@gmail.com'; 'parknohsang@paran.com'
참조: jykim1 (Joo-Young Kim)
제목: [박노상님]김.장법률사무소입니다.
첨부 파일: 05-597-B-Specification.pdf

Re: 미국특허출원번호 제 10/560,664 (당소정리번호 FE241483)

안녕하십니까 김장법률사무소입니다.

지난 2006년 6월 20일자 전화통화를 통해 본건의 미국출원과 관련하여 도움을 주실수 없다는 입장을 밝히셨으며, 이에 따라 저희 사무소에서는 이러한 의사를 미국특허청에 전달하고 미국출원 절차를 진행하고 있습니다.

이 과정에서 저희 사무소에서는 선생님께 발명신고서를 첨부하여 검토를 부탁드렸으나, 미국특허청에서는 미국특허청에 제출된 미국출원 명세서도 함께 선생님께 보내드려야 한다는 의견입니다.

다소 번거로우시겠지만, 첨부된 미국출원 명세서를 검토하신후 이에 대한 협조여부를 회신으로 알려주시면 감사하겠습니다.

김.장법률사무소
변리사 김주영 (전화 02-2122-3561)
과장 임지원 (전화 02-2122-3838)

Ji-Won Lim
zjwlim@ip.kimchang.com
직통 : (02) 2122 3838

金·張 法律事務所
서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764-8855 / (02) 2122-3900 (대표)
팩스: (02) 741-0328 / (02) 745-5954 / (02) 763-7434

위 전자우편에 포함된 정보는 위에 기재된 수신인만을 위해 발송되는 것으로서 보안을 유지해야 하는 정보 및 법률상 또는 다른 사유로 인하여 공개가 금지된 정보가 들어 있을 수 있습니다. 귀하가 이 전자우편의 지정 수신인이 아니면 이를 무단으로 보유, 전송, 배포할 수 없으며, 일부의 내용이라도 공개, 복사해서는 안됩니다. 그러므로, 잘못 수신된 경우에는 즉시 전화 또는 전자우편 주소(all@ip.kimchang.com)로 연락하여 주시고, 원본 및 사본과 그에 따른 첨부 문서를 모두 삭제하여 주시기 바랍니다.

[Translation]

[E-mail to the inventor Noh Sang Park from K&C staff, Jiwon Lim]

From: zjwlim (Ji-Won Lim)
Date: February 7, 2007 6:32 PM
To: nspark@shinbiro.com; parknohsang@gmail.com; parknohsang@paran.com
Cc: jykim1 (Joo-Young Kim)
Subject: [To. Mr. Noh Sang Park] An announcement from Law offices of Kim & Chang
Attachment(s): 05-597-B-Specificatin.pdf

Re: U.S. Patent Application No. 10/560,664 (Our Ref. FE241483)

Below is an announcement from the law offices of Kim & Chang:

With respect to the above-identified application, we understood from our telephone contact made on June 20, 2006 that your position was not to cooperate with us. Thus, we conveyed your position to the U.S. Patent and Trademark Office in due course.

In this regard, we have provided you with the Inventor's Declaration, as submitted to Hyundai Syscomm, for your review. Furthermore, we also provide you with the specification and drawings as filed with the U. S. Patent and Trademark Office for your review.

We understand your views may be complex, however, we would appreciate it if you could notify us of your decision after reviewing the U.S. specification and drawings via e-mail. If you have any questions or comments, please do not hesitate to contact us. We look forward to your response.

Law Offices of Kim & Chang
Patent Attorney Joo-Young Kim (Tel. 02-2122-3561)
Assistant Manager Jiwon Lim (Tel. 02-2122-3838)

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(71) Applicant (*for all designated States except US*): UTStarcom Korea Limited [KR/KR]; San 136-1, Ami-ri, Bubal-eub, Icheon-si, Kyongki-do 467-701 (KR).

(72) Inventors; and
(75) Inventors/Applicants (*for US only*): KIM, June Man [KR/KR]; Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-708 (KR). PARK, Noh Sung [KR/KR]; Jangmi Kolon Apt. 120-201, Yatap-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-788 (KR).

(74) Agent: YOON, Jee Hong; Hannuri Bldg., 219, Naeja-dong, Chongno-gu, Seoul 110-053 (KR).

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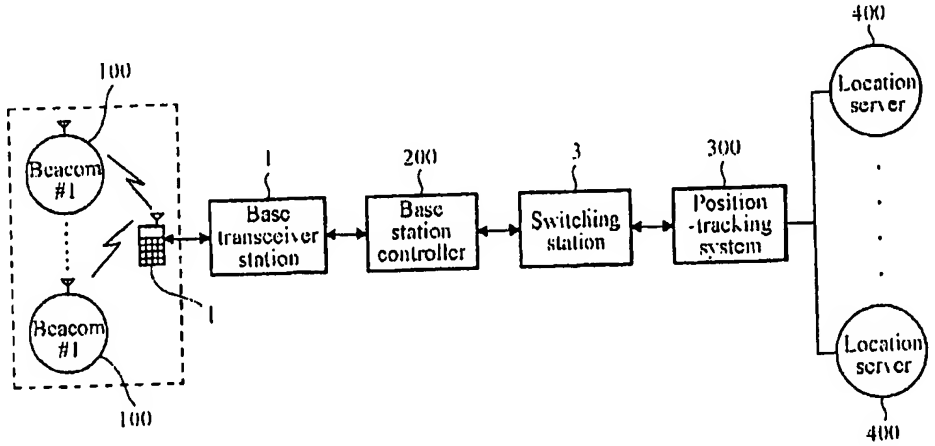
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM



(57) Abstract: The present invention relates to a device for tracking the position of a mobile unit in a mobile communication system by using beacons, wherein each beacon has its own sub-coverage in the cell coverage of a base transceiver station (BTS). The present invention resolves the problems of the conventional network-based or handset-based position tracking methods. By using beacon information included in a Pilot Strength Measurement Message (PSMM) signal, the present invention increases the accuracy of position tracking to thereby improve the quality of supplemental services in the mobile communication system.

WO 2005/011153 A1

Description

SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM

Technical Field

[1] The present invention generally relates to tracking position of a mobile unit in a mobile communication system, and more particularly to a system and a method for tracking position of a mobile unit by using a plurality of beacons. The beacons, each of which has a certain coverage, are installed within a cell coverage of a base station such that when a mobile unit comes into the coverage of a beacon, the current position of the mobile unit can be accurately determined by using information on the beacon.

Background Art

[2] One of the conventional methods for tracking position of a mobile unit is a network-based positioning approach which uses specialized location equipment within the network to determine the location of a mobile unit. The other conventional method is a handset-based positioning approach which uses specialized electronics, such as a global positioning system (GPS), within the mobile unit.

[3] The accuracy of positioning the mobile unit by the conventional methods, however, can be significantly compromised in metropolitan environments where local obstructions, such as large buildings, often disrupt signal reception. While moving through regions crowded with large buildings, the mobile unit oftentimes cannot receive signals from satellites for tracking position or pilot signals from neighboring base stations due to crowded environments. As shown in Fig. 1, the network-based positioning approach employs pilot signals from the neighboring base stations to track position of the mobile unit. The mobile unit must receive pilot signals from at least 3 neighboring base stations in order to accurately determine the position. In the metropolitan environment, however, it is practically impossible for the mobile unit to receive pilot signals from at least 3 neighboring base stations.

Disclosure of Invention

Technical Problem

[4] This resulted in the significant degradation in the accuracy of determining the position of the mobile unit, which in turn adversely affected the quality of the location-based supplemental service in a mobile communication. The conventional methods

simply could not satisfy the expectations of subscribers for the location-based service.

Technical Solution

[5] In order to address and resolve the problems of the conventional approaches, the present invention provides a system for tracking position of a mobile unit in a mobile communication system. The system comprises a plurality of beacons installed within a cell coverage of a base station, in which each beacon has its sub-coverage and transmits a pilot signal to the mobile unit in the sub-coverage. Further, a base station controller is provided for checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal upon receiving the PSMM signal from the mobile unit via a base transceiver station. The base station controller transmits position information including the beacon information if the beacon information is included in the PSMM signal. Such controller transmits neighbor list information on base transceiver stations adjacent to the mobile unit if the beacon information is not included in the PSMM signal. The system additionally comprises a position-tracking device for extracting information on the corresponding beacon from its database by using the position information upon receiving the position information including the beacon information from the base station controller. It then tracks/determines the position of the mobile unit by using the information on the corresponding beacon. Alternatively, the position-tracking device tracks/determines the position of the mobile unit by a conventional position-tracking method by using the neighbor list information on the adjacent base transceiver stations upon receiving the neighbor list information on the base transceiver stations adjacent to the mobile unit from the base station controller.

[6] The present invention further provides a method for tracking the position of a mobile unit in a communication system including the mobile unit, beacons, base station controller and position-tracking device. The method comprises: checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal when the base station controller receives the PSMM signal from the mobile unit; transmitting position information including the beacon information from the base station controller to the position-tracking device if the PSMM signal from the mobile unit contains the beacon information; and extracting information on the corresponding beacon from the database of the position-tracking system when the position-tracking system receives the position information including the beacon information from the base station controller and tracking/determining the position of the mobile unit by using the information on the corresponding beacon.

Advantageous Effects

[7] The system and the method for tracking position by using beacons in accordance with the present invention can improve the reliability and the accuracy of determining the position of the mobile unit. Such system and method can further improve the quality of the location-based supplemental services.

Brief Description of the Drawings

[8] The above and other objects and features of the present invention will become apparent from the following description of the embodiments provided in conjunction with the accompanying drawings.

[9] Fig. 1 is a schematic diagram for illustrating the conventional network-based positioning approach.

[10] Fig. 2 is a schematic diagram of a system for tracking position by using beacons in accordance with the present invention.

[11] Figs. 3 to 6 illustrate configurations of beacons installed within a cell coverage of the base station shown in Fig 2.

[12] Fig. 7 is a flow chart showing a method for tracking position of a mobile unit by using beacons in accordance with an embodiment of the present invention.

Best Mode for Carrying Out the Invention

[13] Referring to Fig. 2, the system for tracking position by using beacons in accordance with the present invention comprises a plurality of beacons 100, a base station controller 200 and a position-tracking device 300 (which is commonly referred to as a position determination entity (PDE)).

[14] A plurality of the beacons 100 is installed in a cell coverage of a base station 2. Each beacon 100 has its own sub-coverage and transmits a pilot signal to a mobile unit located in its sub-coverage. The beacons 100, each of which has the same radius of sub-coverage, may be installed to cover the whole area of the cell coverage of the base station 2 as shown in Fig. 3. The beacons 100, each of which has a different radius of sub-coverage, may be installed to cover particular regions of the cell coverage of the base station 2 (shown in Fig. 4). The beacons may be installed as shown in Fig. 5 so that at least three virtual pilot signals are provided at regions having only one-way pilot signal within the cell coverage of the base station 2 to improve the tracking accuracy. Alternatively, the beacons may be installed at borders with adjacent base stations as shown in Fig. 6 so that two-way pilot signal can be provided at regions having only one-way pilot signal to guarantee the accuracy of tracking within the cell

coverage. The configuration of the beacons 100 in the cell coverage of the base station 2 may be adjusted according to the local environments. The radius of the sub-coverage of the beacon 100 ranges from 5m to 300m, which can be adjusted by the power of the pilot signal.

[15] The base station controller 200 transmits a Pilot Strength Measurement Message (PSMM) request to the mobile unit 1. It then checks whether the PSMM signal received from the mobile unit 1 during a transmission period of the PSMM signal includes the beacon information. If the PSMM signal contains the beacon information, then the base station controller 200 transmits the position information containing the beacon information to the position-tracking device 300 via the switching station 3. The position information transmitted from the base station controller 200 to the position-tracking device 300 includes pilot number (PN) information of the corresponding beacon 100, delay information representing a distance from the center of the corresponding beacon to the mobile unit 1, and time stamp information representing measurement time of the mobile unit 1.

[16] When the PSMM signal received from the mobile unit 1 does not contain the beacon information, the base station controller 200 transmits the neighbor list information on base transceiver stations 2 adjacent to the mobile unit 1 to the position-tracking device 300 via the switching station 2.

[17] When the position-tracking device 300 receives the position information containing the beacon information from the base station controller 200, the position-tracking device 300 extracts information on the corresponding beacon 100 from its database using the position information. Then, it tracks/determines the position of the mobile unit 100 through using the extracted information on the corresponding beacon 100. The information extracted from the database of the position-tracking device 300 includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon. The position-tracking device further transmits the information on the position of the mobile unit 1 to location servers 400.

[18] When the position-tracking device 300 receives the neighbor list information on the base transceiver stations 2 adjacent to the mobile unit 100 from the base station controller 200, the position-tracking device 300 determines the position of the mobile unit 1 by using the neighbor list information according to the conventional position-tracking method. It then transmits the information on the position of the mobile unit 1 to the location servers 400.

[19] Referring now to Fig. 7, a method for tracking position of a mobile unit by using beacons is described in accordance with an embodiment of the present invention.

[20] At step 100, the base station controller 200 checks whether the PSMM signal received from the mobile unit 1 contains the beacon information.

[21] When the PSMM signal received from the mobile unit 1 contains the beacon information, the base station controller 200 transmits the position information including the beacon information to the position-tracking device 300 at step 200. The position information transmitted from the base station controller 200 to the position-tracking device 300 includes pilot number (PN) information of the corresponding beacon 100, delay information representing a distance from the center of the corresponding beacon to the mobile unit 1, and time stamp information representing measurement time of the mobile unit 1.

[22] At step 300, when the position-tracking device 300 receives the position information including the beacon information, the position-tracking device 300 extracts the information on the corresponding beacon from its database by using the position information. Then, the position-tracking device 300 determines the position of the mobile unit 1 through using the extracted information on the corresponding beacon 100. The information extracted from the database of the position-tracking device 300 includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon. The tolerance for the accuracy of positioning the mobile unit in accordance with the present invention is about 30 m, which is better than that of the conventional network-based approach or the handset-based positioning approach (e.g., 100 m).

[23] When the PSMM signal received from the mobile unit 1 does not contain the beacon information, the base station controller 200 transmits the neighbor list information on base transceiver stations adjacent to the mobile unit 1, which is necessary to track position according to the conventional approach, to the position-tracking device 300 at step 400.

[24] After receiving the neighbor list information from the base station controller 200, the position-tracking device 300 tracks/determines the position of the mobile unit 1 by using the neighbor list information. This is done by the conventional position-tracking method at step 500.

[25] The information on the location of the mobile unit, which was determined through steps 100 to 500, is transmitted to the location servers 400 and can be used in various location-based supplemental services of the mobile communication.

Industrial Applicability

[26] As described above, the system and the method for tracking position by using beacons in accordance with the present invention can enhance the reliability and the accuracy of tracking position. As such, the quality of the location-based supplemental services can be improved.

[27] Furthermore, in accordance with the present invention, at least two-way pilot signal is provided by beacons at regions within the cell coverage of a base station where signals from the adjacent base stations is not present, that is, where only one-way pilot signal is present. This improves the accuracy of tracking position.

[28] While the present invention has been shown and described herein with respect to the particular embodiments, those skilled in the art will recognize that many exchanges and modifications may be made without departing from the scope of the invention as defined in the appended claims.

Claims

[1] A system for tracking position of a mobile unit in a mobile communication system, comprising

a plurality of beacons installed within a cell coverage of a base station, each beacon having its sub-coverage and transmitting a pilot signal to the mobile unit in the sub-coverage;

a base station controller for checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal upon receiving the PSMM signal from the mobile unit via a base transceiver station, the base station controller transmitting position information including the beacon information if the beacon information is included in the PSMM signal, the base station controller transmitting neighbor list information on base transceiver stations adjacent to the mobile unit if the beacon information is not included in the PSMM signal; and

a position-tracking device for extracting information on the corresponding beacon from its database by using the position information upon receiving the position information including the beacon information from the base station controller, the position-tracking device further tracking/determining the position of the mobile unit by using the information on the corresponding beacon, or for tracking/determining position of the mobile unit by a conventional position-tracking method by using the neighbor list information on the adjacent base transceiver stations upon receiving the neighbor list information on the base transceiver stations adjacent to the mobile unit from the base station controller.

[2] The system of claim 1, wherein the radius of the sub-coverage of the beacon ranges from about 5 m to about 300 m.

[3] The system of claim 1, wherein the position information transmitted from the base station controller to the position-tracking device includes pilot number (PN) information of the corresponding beacon, delay information representing a distance from the center of the corresponding beacon to the mobile unit, and time stamp information representing measurement time of the mobile unit.

[4] The system of claim 1, wherein the information on the corresponding beacon which is extracted from the database of the position-tracking device includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon.

[5] The system of claim 1, wherein each beacon has the same radius of coverage and a plurality of the beacons are installed uniformly to cover the whole area of the cell coverage of a particular base station.

[6] The system of claim 1, wherein each beacon has different radius of coverage and a plurality of the beacons are installed at only particular regions within cell coverage of a particular base station to cover only the particular regions.

[7] The system of claim 1, wherein a plurality of the beacons are installed so that virtual PN is provided toward inside the border of the cell coverage of a particular base station at regions within the cell-coverage of the particular base station where only one pilot signal is sensed.

[8] The system of claim 1, wherein each beacon has the same radius of coverage and a plurality of the beacons are installed so that virtual PN is provided to a cell coverage of a particular base station and to a cell coverage of adjacent base stations at regions within the cell-coverage of the particular base station where only one pilot signal is sensed.

[9] A method for tracking position of a mobile unit in a communication system including the mobile unit, beacons, a base station controller and a position-tracking device, the method comprising:

checking whether beacon information is included in a Pilot Strength Measurement Message (PSMM) signal when the base station controller receives the PSMM signal from the mobile unit;

transmitting position information including the beacon information from the base station controller to the position-tracking device if the PSMM signal from the mobile unit contains the beacon information; and

extracting information on the corresponding beacon from the database of the position-tracking device when the position-tracking device receives the position information including the beacon information from the base station controller, and tracking/determining the position of the mobile unit using the information on the corresponding beacon.

[10] The method of claim 9, further comprising

transmitting neighbor list information on the base transceiver stations adjacent to the mobile unit to the position-tracking device if the PSMM signal received from the mobile unit does not contain the beacon information,

tracking/determining the position of the mobile unit by a conventional position-tracking method through using the neighbor list information when the position-

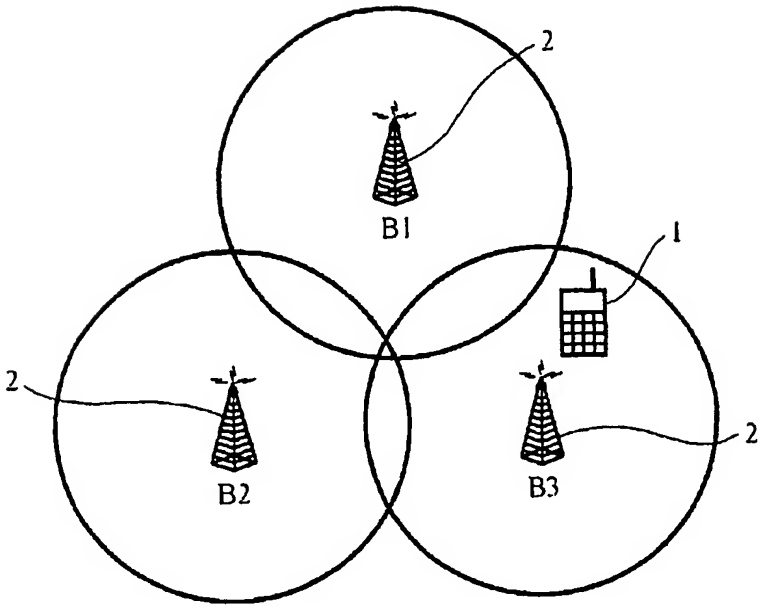
tracking device receives the neighbor list information from the base station controller.

[11] The method of claim 9, wherein the position information including the beacon information, which the base station controller transmits to the position-tracking system, includes pilot number (PN) information of the corresponding beacon, delay information representing a distance from the center of the corresponding beacon to the mobile unit, and time stamp information representing measurement time of the mobile unit.

[12] The method of claim 9, wherein the information on the corresponding beacon, which is extracted from the database of the position-tracking device includes latitude, longitude, coverage radius of the corresponding beacon and other information on environments of the corresponding beacon.

[13] The method of claim 9, wherein the tracked information on the position of the mobile unit is employed in the location-based supplemental service of the mobile communication system.

[Fig. 1]



[Fig. 2]

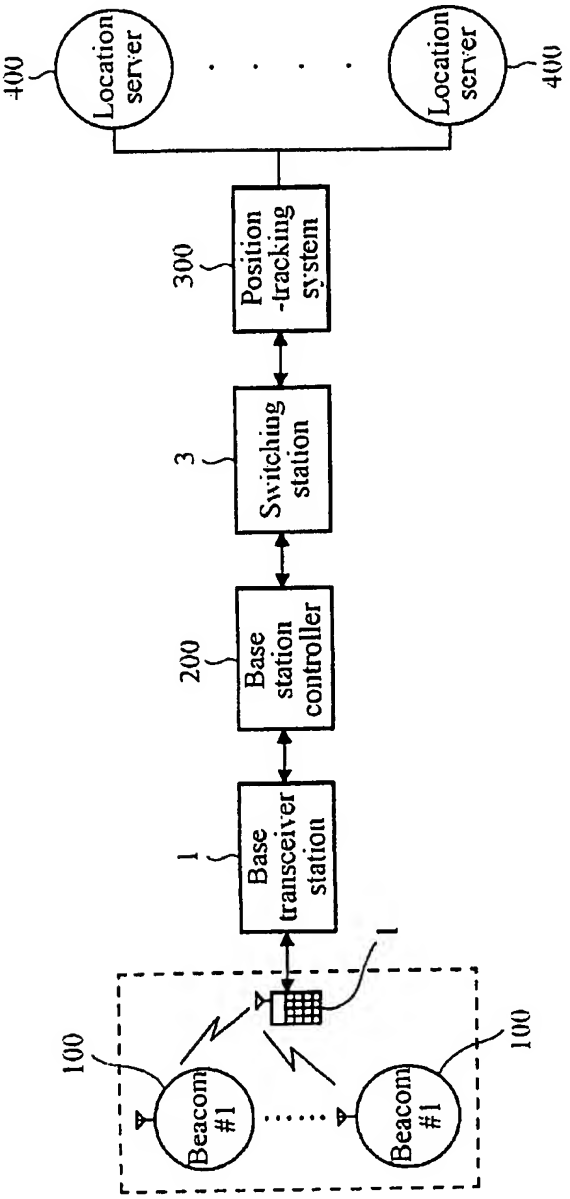
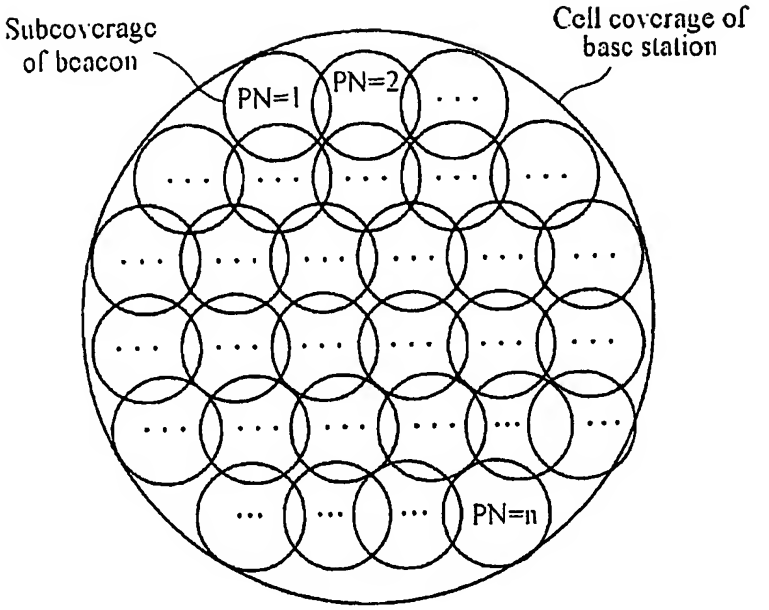
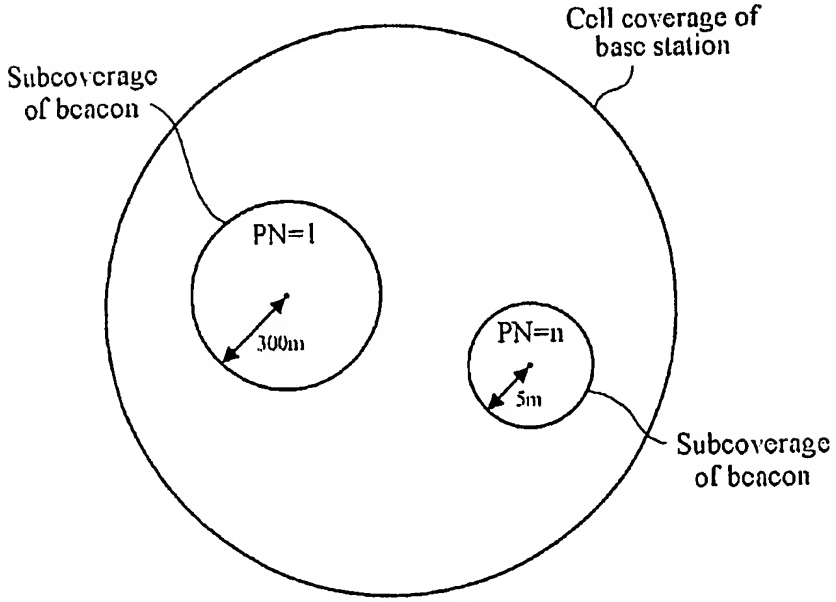

400
Location server
Location server
400
300
Position -tracking system
3
Switching station
200
Base station controller
1
Base transceiver station
100
Beacom #1
Beacom #1
100

Fig. 2

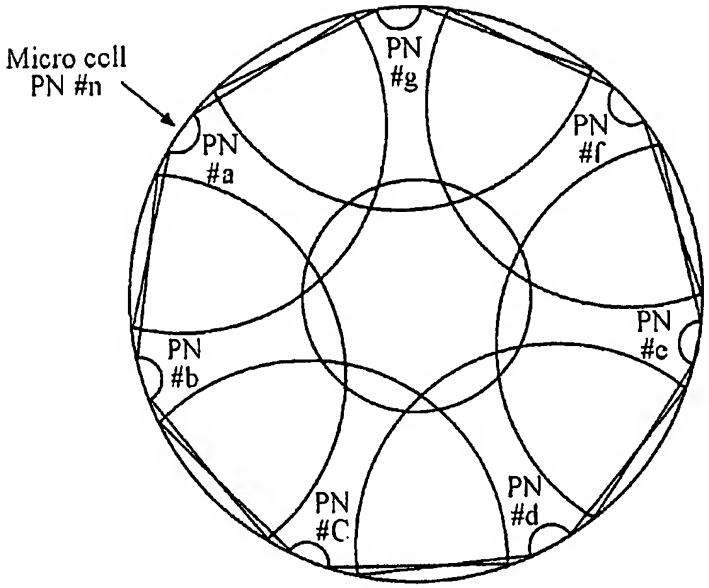
[Fig. 3]


Subcoverage of beacon
Cell coverage of base station
PN=1
PN=2
PN=n

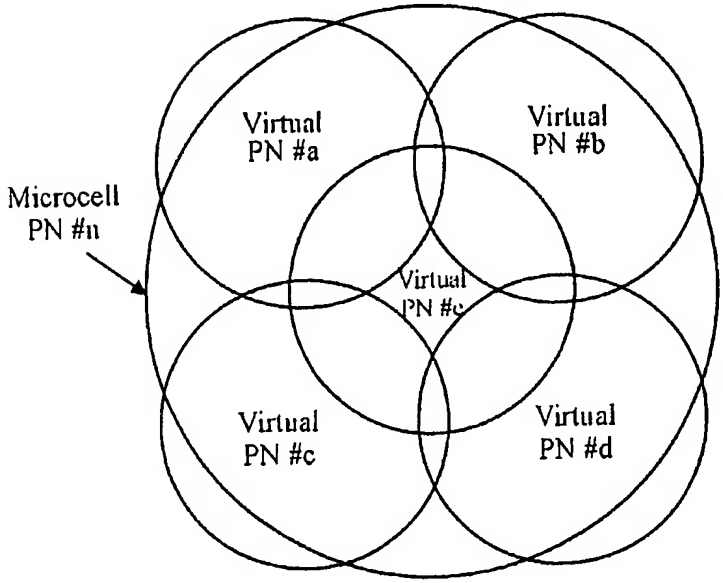
[Fig. 4]


Cell coverage of base station
Subcoverage of beacon
PN=1
300m
PN=n
5m
Subcoverage of beacon

[Fig. 5]


Micro cell
PN #n
PN
#g
PN
#a
PN
#f
PN
#c
PN
#b
PN
#C
PN
#d

[Fig. 6]


Virtual
PN #a
Virtual
PN #b
Microcell
PN #n
Virtual
PN #c
Virtual
PN #c
Virtual
PN #d

[Fig. 7]

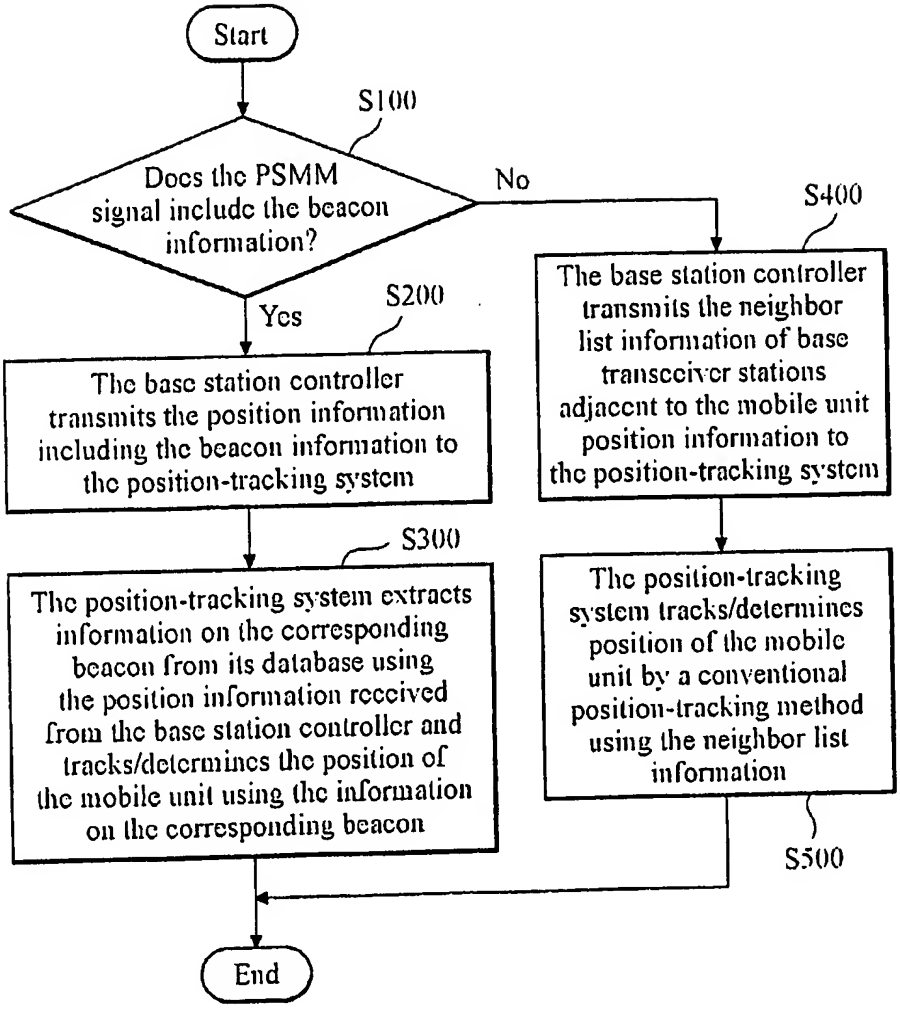

Start
S100
Does the PSMM signal include the beacon information?
No
S400
The base station controller transmits the neighbor list information of base transceiver stations adjacent to the mobile unit position information to the position-tracking system
Yes
S200
The base station controller transmits the position information including the beacon information to the position-tracking system
S300
The position-tracking system extracts information on the corresponding beacon from its database using the position information received from the base station controller and tracks/determines the position of the mobile unit using the information on the corresponding beacon
The position-tracking system tracks/determines position of the mobile unit by a conventional position-tracking method using the neighbor list information
S500
End

EXHIBIT 8

num_ip.txt

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[Translation]

Telephone Log

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US 10/560,664 (NS PARK)
DOC.2

[Translation]

Telephone Log

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3561	2007-02-27 18:52:46	00:02:01	0173423248	mobile phone	207(KRW)

EXHIBIT 9

金·張 法律事務所
KIM & CHANG

서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764-8855 / 2122-3900 Fax: (02) 745-5954 / 741-0328 / 763-7434
E-Mail: all@ip.kimchang.com

2007년 3월 7일

수 신 : 김 준 만 님
경기도 성남시 분당구 구미동 신한아파트 303동 401호 (우.303-401)

제 목 : 미국 특허청 제출 명세서 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : FE241483 (MBHB 05-597-B)
(발명의 명칭: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM)

<MEMORANDUM>

안녕하십니까 김.장법률사무소입니다.

2007년 2월 7일자로 본건의 미국 출원용 명세서를 보내드린 바 있습니다만, 이와 관련하여 당소 담당자(변리사 김주영)와의 전화통화(전화번호: 011-705-3719 2007년 2월 9일 14:57:59~15:08:15)를 허락해 주신점 감사합니다.

당소에서는 상기 발명의 미국 출원 진행에 협조할 의향이 없으시다는 선생님의 의사를 충분히 이해하였으며, 이에 기초하여 미국 출원 절차를 진행하도록 하겠습니다.

본건과 관련하여 불편을 끼친 점에 대해서는 양해를 부탁 드리겠습니다.

이와 관련하여 다른 궁금하신 점이 있으시면 언제든지 연락 주십시오. 감사합니다.

-담당자: 김 주 영 변리사 / 윤 지 홍 변리사
-전화: 02-2122-3561 / 02-2122-3515
-E-mail: jykim1@ip.kimchang.com

변리사 윤 지 홍

이 우편물은 2007-03-07 제 07028455
호에 의하여 내용증명우편물로
발송하였음을 증명함
광화문 우체국장

[Translation]

KIM & CHANG

Hungkuk Life Insurance Building, 9F, 226 Sinmunno 1-ga, Jongno-gu, Seoul 110-786, Korea
Telephone: (822) 764-8855 / 2122-3900 Fax: (822) 741-0328 / 745-5954 / 763-7434
E-Mail: all@ip.kimchang.com

March 7, 2007

To. Mr. June Man Kim
Sinhan Apt. 303-401, Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do
463-708, Republic of Korea

Re. Declaration and Power of Attorney and Assignment to be filed with U.S. Patent and Trademark Office (U.S. Serial No. 10/560,664)
K&C Ref.: FE241483 (MBHB 05-597-B)

<MEMORANDUM>

Dear Mr. Kim,

As you know, we have provided you with the specification and drawings, as filed with the U.S. Patent and Trademark Office, in our e-mail of February 7, 2007. In this regard, we appreciate you taking the time to contact Patent Attorney Joo-Young Kim of Kim & Chang on February 9, 2007 (phone number 011-705-3719, 14:57:59 ~ 15:08:15)

We fully understand that you will not be cooperating in this U.S. patent application. Further, we will convey the inventor's confirmation to the U.S. associate so that inventor's noncooperation will be filed with the U.S. Patent and Trademark Office.

We apologize for any inconveniences that may have been caused to you.

If you have any other questions in this matter, please do not hesitate to contact us.

-Contact Person: Attorney Joo-Young KIM/
Attorney Jee Hong YOON
-Telephone: 02-2122-3561 / 02-2122-3515
-E-mail: jykim1@ip.kimchang.com

GWANG WHA MOON POST OFFICE- CONTENTS CERTIFIED MAIL CERTIFICATE NO. 07028455, 2007-03-07

Attorney Jee Hong YOON (seal)

金·張 法律事務所
KIM & CHANG

서울시 종로구 신문로 1가 226 흥국생명빌딩 9층 우편번호 110-786
전화: (02) 764-8855 / 2122-3900 Fax: (02) 745-5954 / 741-0328 / 763-7434
E-Mail: all@ip.kimchang.com

2007년 3월 7일

수 신 : 박 노 상 님
경기도 성남시 분당구 야탑동 장미코오롱아파트 117동 605호 (우.463-788)

제 목 : 미국 특허청 제출 명세서 송부의 건 (U.S. Serial No. 10/560,664)
당소 정리 번호 : FE241483 (MBHB 05-597-B)
(발명의 명칭: SYSTEM AND METHOD FOR TRACKING POSITION OF A MOBILE UNIT USING BEACONS IN A MOBILE COMMUNICATION SYSTEM)

<MEMORANDUM>

안녕하십니까 김.장법률사무소입니다.

2007년 2월 7일자로 본건의 미국 출원용 명세서를 보내드린 바 있습니다만, 이와 관련하여 당소 담당자(변리사 김주영)와의 전화통화(전화번호: 017-342-3248 2007년 2월 27일 18:52:46~18:54:47)를 허락해 주신점 감사합니다.

당소에서는 상기 발명의 미국 출원 진행에 협조할 의향이 없으시다는 선생님의 의사를 충분히 이해하였으며, 이에 기초하여 미국 출원 절차를 진행하도록 하겠습니다.

본건과 관련하여 불편을 끼친 점에 대해서는 양해를 부탁 드리겠습니다.

이와 관련하여 다른 궁금하신 점이 있으시면 언제든지 연락 주십시오. 감사합니다.

-담당자: 김 주 영 변리사 / 윤 지 홍 변리사
-전화: 02-2122-3561 / 02-2122-3515
-E-mail: jykim1@ip.kimchang.com

변리사 윤 지 홍

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Telephone: (822) 764-8855 / 2122-3900 Fax: (822) 741-0328 / 745-5954 / 763-7434
E-Mail: all@ip.kimchang.com

March 7, 2007

To. Mr. Noh Sang Park
Jangmi Kolon Apt. 117-605, Yatap-dong, Bundang-gu, Seongnam-si,
Gyeonggi-do 463-788, Republic of Korea

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GWANG WHA MOON POST OFFICE- CONTENTS CERTIFIED MAIL CERTIFICATE NO. 07028454, 2007-03-07

-Contact Person: Attorney Joo-Young KIM/ Attorney Jee Hong YOON
-Telephone: 02-2122-3561 / 02-2122-3515
-E-mail: jykim1@ip.kimchang.com

Attorney Jee Hong YOON (seal)